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The Cavalry Journal

Published Bi-Monthly by The United States Cavalry Association

COLONEL EDWIN M. SUMNER, *(Cav.) G.S.C., Editor*

CHRISTINE HARBOUR, *Associate Editor* MR. SGT. HOWARD M. COLLINS, *Circulation*

Volume LII MAY-JUNE, 1943 Number 3

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Publication date: May 20, 1943. Deadline date, next issue: June 10, 1943.

THE CAVALRY JOURNAL IS NOT RESPONSIBLE FOR OPINIONS EXPRESSED IN PUBLISHED CONTRIBUTIONS

Editorial offices: 1719 K Street, Northwest, Washington, D. C.

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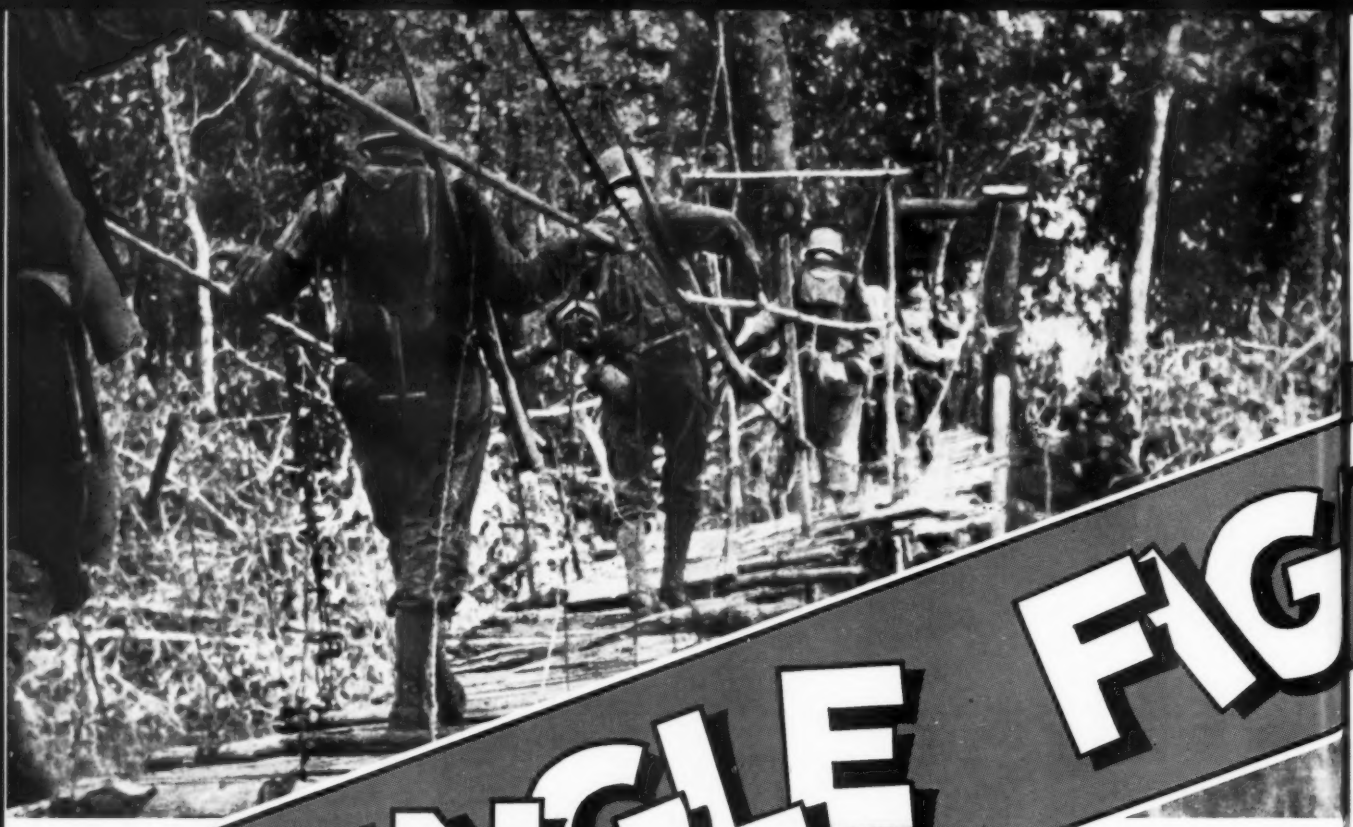
Publication offices: 1406 East Franklin Street, Richmond, Virginia. Entered as second class matter at Richmond, Virginia, under the act of March 3, 1879, for mailing at special rate of postage provided in Section 412, Act of October 3, 1917. Terms: Domestic subscriptions, individual and organization, $3.00 per year. Foreign, $3.50 per year. Canada: including War Exchange Tax, $3.50. All subscriptions payable in advance. Single copies, 75c. Extra copies to subscribers, 50c. THE CAVALRY JOURNAL *does not* carry paid advertisements.



JUNGLE FIG

by Captain
Willard O. Foster, Jr., Cavalry

This article, received by air mail from Guadalcanal, contains invaluable training data for every officer, non-commissioned officer or private who may find himself pitted against the Japs!

THE material that has been issued by the War Department on training for jungle combat is good. There is no doubt about that. Any unit that uses this material, and is well trained, will beat the Japs six hands around. And there is no doubt about that, either!

There are a lot of things, however, that cannot be learned from books. They have to be learned the hard way—and in war the hard way really hurts. It is in an effort to ease this hurt that these notes are written. They are the result of observations made during three and one-half months of active combat against the Japanese in the jungles of Guadalcanal. The original comments were written on the spot as the observations were made. The material itself was written immediately after the combat had ceased in order that the lessons learned would not lose their freshness through the passage of time.

Jungle Reconnaissance

"Another officer lost on patrol today. Patrol straggled in—no decent info. When will they learn!"

Yes, when will they learn that when an officer is conducting a patrol, his position is *not* in the point. Patrols in the jungle are constant. They are the only means that a commander has at his disposal to gain intelligence of the Japs opposing him. In training for jungle combat, the manual, "Scouting and Patrolling," should be placed alongside FM 31-20, "Jungle Warfare," and both should be used as corner-stones upon which to build the training program. A few points on jungle patrols, however, should be stressed.

Reconnaissance Patrols Must Also Fight. When fighting in the jungle, it is difficult to distinguish between "combat" and "reconnaissance" patrols. To restrict a patrol leader to pure reconnaissance (except in isolated instances) is to hamper seriously and even endanger that patrol. Jungle patrols *must* be aggressive when the situation demands. It is often their only true means of defense. A patrol should always seek information, but it likewise should always seek to cause as much discomfort to the enemy as possible. In the jungle, where patrols do 75% of the fighting, a strict "reconnaissance" patrol should seldom be employed.

Observations made during three and one-half months of fighting the Japs on Guadalcanal.

TING

The Reconnaissance Commander. Patrol leaders must learn proper patrol formations and patrol technique. Errors commonly noted in combat were many. Patrol leaders up with the point—"to see what was going on!" No getaway man! No point! Nobody in the patrol knows its mission except the leader! Put these together and get the story of the patrol that goes out, gets hit, and wanders back in as individuals three or four hours later with garbled stories of what happened and no information as to where, how many, or where the rest of the patrol went.

Some unit commander figured during training that the manual on "Scouting and Patrolling" looked like "kindergarten stuff." The same unit commander now begins to think about such things as *double points* (the Japs use that formation), assembly points along the route, two getaway men, a man in the rear to drop back every few minutes to listen for noises of a tracking enemy, and above all, experienced noncoms as leaders and second-in-commands of small patrols, and steady officers as leaders of larger patrols.

A scouting party of American soldiers come to a sudden stop as the bushes ahead begin to move.

European

Natural Reconnaissance Scouts. It soon becomes apparent in every unit that a certain group of men become well versed in the ways of the jungle and the wiles of the Jap. These are generally men who have grown up in country surroundings, used to hardships, clever in woodcraft. When these individuals show up, an attempt should be made to segregate them, to organize them if possible, into a group that may be used for more difficult patrol missions. As individual "scouts" or in groups as patrols, these men soon prove themselves invaluable. On the difficult "pure reconnaissance" patrols these men will be the only ones capable of slipping through the enemy positions without detection and gaining the information desired. They soon develop a pride in their ability as compared with their fellow soldiers, and the commander who is clever enough to spot and organize such a group can, by their correct employment, raise considerably the patrolling standards of his entire command.

Use of Weapons

"We've got to change a lot of our ideas on how to use our weapons in this type of thing. And don't forget mortars!"

Many of our principles of employment of weapons become worthless when combat in the jungle is undertaken. At the same time, other principles assume an even greater importance. A few of both kinds will be discussed:

Field of Fire. Because of heavy undergrowth, the possibility of obtaining a field of fire optimum to the specific weapon employed is more often than not impossible. Along jungle trails, it may be considered fortunate if a range of 50 yards can be obtained. On the other hand, over open ridges often found in jungle country, or along streams in their upper reaches where they have a straight-a-way run of some distance, fields of fire may be employed properly. In the depths of the jungle, however, the greatest consideration must be placed on the lack of proper ranges, and the fire lines and automatic gun positions must be taken in the most advantageous spot.

The Japanese overcome this lack of proper ranges in many cases by spotting even heavy machine guns in the high branches of jungle trees or in the top of coconut trees in palm groves. By so doing, concealment is enhanced as well.

When the opportunity offers, we should avail ourselves of this Japanese example and emulate it.

Note: Closely allied to fields of fire is the subject of *ambushes and their employment*, as fields of fire, or the lack of them play an important part in their set-up. (See page 6.)

With the lack of proper ranges, it is seldom that sights other than the battle sight are ever employed. An exception to this is the *sniper*. (See page 5.)

Cover and Concealment. Concealment in the jungle is easy to obtain, while cover is often difficult. So few gun positions are available in the limited open terrain that cover must often be sacrificed. Prolific vegetation, however, enables concealment with ease. Care must be taken to make use of natural growth as cut vegetation withers rapidly in the heat. Artificial forms of camouflage are to be avoided if possible, as any disturbance of, or variation from, nature's rich growth stands out like a beacon.

Many jungle islands are coral formed, and often good cover for positions may be found in the rough coral ridges. This same coral, however, makes entrenched gun positions not only difficult, but in most cases, impossible.

Effective Combat Ranges of Weapons. It must be realized that in the jungle, most combat is undertaken at extremely close ranges. Practically all targets are those of opportunity only.

Extensive preparation for so-called "snap shooting" should be employed in the jungle training program. Extreme handiness with weapons is desired. Riflemen are often required to rely upon even "hip shooting," while crews of automatic weapons must be proficient to the *nth* degree in manipulation. Setting-up of jungle target courses in the training program is very desirable.*

Automatic Weapons in Defense. The employment of automatic weapons in defense is not only normal in the jungle, but it is practically the only way in which they can be employed. Machine guns, both light and heavy, should be left on defensive lines; while the attack should be made with the lighter BAR's supporting the riflemen. Attempting to carry the heavier automatic weapons in a humid, hot jungle in an active offensive must be considered impossible. However, when correctly deployed and emplaced on a defensive line in the jungle, automatic weapons prove their worth.

Employment of Mortars. One of the most effective jungle weapons is the mortar. The 81mm may be used both on the defensive and in preparation for an offensive. The 60mm may be used similarly but is furthermore light enough to follow along behind an offensive line. A serious drawback to the employment of this weapon is observation and the resultant sensing.

In the jungle training program, emphasis must be placed on sensing through *sound* rather than visual observation. Range determination likewise must be dependent upon the individual's ears rather than eyes. None-the-less, mortars should be employed to the maximum. Enemy prisoners are strong in their statements concerning the effectiveness of mortar fire. On coral islands, or any formations where steep ravines and high ridges are encountered, mortar fire is more often than not the only means of placing HE on the enemy. Even in level spaces, mortar bursting on contact with upper foliage is heavily destructive over a large area. Mortars must never be underestimated in our jungle combat.

*See article "Quick on the Trigger" in this issue.

Care and Cleaning of Weapons

"Weapons go to pot in no time! Get hold of Jap oil, and use a rag often!"

Heat, humidity, perspiration, and dirt all wreak havoc on weapons in the jungle unless particular care is taken.

Daily Cleaning. It is vitally essential that all weapons be stripped, parts wiped with an oily rag, and fresh oil applied daily. This daily cleaning, which always has been recommended in texts, must become absolutely indoctrinated in troops as a veritable ritual during the time they are in the jungle. It is the *only* way in which weapons in the jungle can be kept in top operating condition at all times.

Oil to Prevent Rust. An oily rag, which when not in use may be wrapped around the stock of a rifle or the grip of a machine gun, should be used for the frequent wiping off of all exposed metal surfaces. Such surfaces may rust in as short a time as six hours if not so protected.

Japanese Gun Oil. It is unfortunate that the type of gun oil now issued U. S. troops is apparently not possessed of sufficient body or viscosity to adhere for any time to metal surfaces under the climatic conditions of and the use put to weapons in the jungle. Japanese gun oil appears far more satisfactory in this respect. It has the consistency of heavy syrup, yet spreads in a thin durable film over the metal without the stickiness that collects dirt and dust. Upon taking Japanese positions, it is worth while to locate and retain for use, all Jap oil found in the flask-type containers attached to rifle belts or in the square brass containers found in automatic gun positions.

Inserted in the front handguard along the barrel of Jap rifles, is a cleaning rod, which will be found to be an excellent supplement in any of our units where only one or two cleaning rods have been issued per squad.

"When correctly deployed and placed on a defensive line in the jungle, automatic weapons prove their worth."

European

"Debunk Jap snipers. And we can work this sniper business two ways."

In combat operations, both offensive and defensive, the use of snipers by Japanese forces is well known. The term "sniper" is, when applied to the Japanese, perhaps misleading. The average Jap sniper is a mere rifleman who has obtained for himself an advantageous position such as a tree-top from which to fire at his enemy. The true Jap sniper, skillfully camouflaged, supplied with concentrated rations and especially armed, accounts for but a small amount of what we presently term "sniper fire."

Value of Snipers. The value of sniper fire has been illustrated in combat. Snipers present a constant problem in both front line and rear areas. During combat operations on Guadalcanal, it was often necessary to employ a patrol with the sole mission of eliminating Jap snipers who had gained positions by infiltration through our lines. There is nothing more disconcerting than to have a battalion, or even a regimental command post, line of supply, or communications, subjected to sporadic fire from a source unknown. Although, in most cases, this fire is extremely inaccurate and causes few casualties, the psychological factor involved is important.

Defense Against Jap Sniper Fire. It has been found that along jungle trails, Jap snipers will seldom fire at parties larger than three or more, because of the fear of detection of their location by the remainder of the group. It has similarly been found that when groups of two or three are searching for snipers by maintaining careful watch or by active patrolling, a similar fear of detection will withhold the sniper's fire. From these two things, we may gain our passive defense lessons. First, individuals or even pairs should never travel along in rear areas where sniper fire may be encountered. Second, an outpost surrounding a headquarters or unit area (even if consisting of but two or three men who give the appearance of and actually do keep a sharp lookout in the direction from which sniper fire is likely to be encountered) will do much towards its prevention.

Both the active defense and the two methods of passive defense will go a long way towards keeping sniper fire at a minimum.

Employment of Sniper Fire By Our Own Troops. The employment of specially armed and equipped riflemen for true "sniper" missions should be adopted when possible.

Weapons for the Sniper. There are two types of weapons that are the most satisfactory for the sniper. The first of these is the Swift or Hornet high-powered .22 caliber with a telescopic sight. This weapon is light but has a high muzzle velocity and is effective at from medium to long range. The model 1903 Springfield, equipped with a telescopic sight, is the other weapon that may be used. Its capabilities are well known and need not be enumerated here. The addition of the telescopic sight enhances its value.

Acme

"The employment of specially armed and equipped riflemen for true sniper missions should be adopted when possible."

Equipment for the Sniper. The issue "jungle suit" is highly satisfactory, provided the boots and helmet are lightly smeared with yellow paint. The pack, as well, should be streaked with yellow, as all of these items are a green with very high blue content, while jungle vegetation has a heavy yellow tinge. Similarly, metallic surfaces should be daubed to prevent reflection where such daubing does not interfere with the operation of the piece.

A good machete, at least two canteens of water and some emergency ration, type D or K, should be carried. Once in place, the sniper should remain as long as his fire is effective. In some cases, this may be from 24 to 36 hours. A small can of oil, a few patches and a draw string will serve to keep the weapon in top operating condition. A pair of climbing irons may be carried, but careless or too frequent use of them should be avoided, as the marks they leave may reveal a sniper's position.

Location of the Sniper. As the mission of the sniper is as much to provide harassing fire as it is the destruction of the enemy, locations should be chosen where fire upon several different targets may be employed. The most advantageous position is often found in high jungle trees, where fire may be brought upon the enemy's rear installations. High terrain overlooking the enemy may also be used. (Warning to the sniper: Never forget to rectify your aim when you are on a level higher than that of your target.)

In order to avoid detection, the position chosen must be entered carefully. A thorough visual reconnaissance of the exact route to be taken, and of any difficulties to be encountered in assuming the position, should be made during the late afternoon; and the position entered early the following morning in the dim light of

the false dawn that precedes sunrise. Once the position is gained, all precautions must be taken to prevent subsequent exposure. The position should be left only at night in order to avoid detection.

Concealment. Concealment must employ the use of natural growing vegetation, as in the jungle, any cut vegetation withers rapidly. Exceptions to this are the fronds of various species of palm. These maintain their freshness in most cases for two or three days. It would not be wise, however, to use palm for concealment in trees whose natural vegetation is at great variation to the shape and color of the palm.

An attempt must be made to blend the form of the body to the vegetation, for not even the jungle suit eliminates the ever dangerous silhouette. When assuming the position, care must be taken not to reveal by broken or scarred vegetation, the course taken or the tree or spot in which the position has been assumed.

Targets. In targets, we may benefit from the Japanese themselves. Destruction of the enemy may be accomplished by firing at individuals by themselves or groups of two or three. Harassing fire may be employed in larger groups providing they appear sufficiently occupied to be unable to determine from what direction the fire has come. Common sense must be used in determining targets. The prevention of exposure or detection by the enemy is the sole criterion.

"Back-Azimuth. One method that has worked in the detection of snipers on several specific occasions is worth noting here. When a member of a patrol is struck by sniper fire, careful determination of the position and attitude of the victim when he was struck and a back azimuth taken along the direction of the wound, may more often than not expose the approximate area from which the shot was fired. A careful search of this estimated area will often lead to the discovery of the sniper.

Ambushes

"A good ambush needed here. Ambushes are OK—if you don't get your tail caught in your own trap!"

In the jungle, where concealment is so easily obtained and where movement is so closely restricted, ambushes may be employed easily and with good effect in either defensive or offensive operations. A correctly organized ambush must take several factors into consideration: location, concealment, depth, field of fire, and route of withdrawal may be mentioned.

Location. Unless the enemy comes freely into the ambush where he may be trapped, the most carefully organized and set up ambush may be worthless. Therefore, reconnaissance of enemy trails, supply routes, etc., must be carried out carefully in order to determine the place where the ambush may be employed most successfully.

Suggested ambush locations are twisting trails, water points or "water holes," enemy defensive positions occupied only when the area defended is threatened (a favorite Jap tactic), supply routes used by carriers, and jungle stream trails. In any one of these locations it is often possible to ambush large enemy parties, patrols, or supply carriers. Consideration of location must be combined with the other factors listed above and discussed below.

Concealment. Concealment is highly necessary in ambush operations as any suspicious appearance will foil all ambush attempts. Movement, once the enemy becomes visible, is a dead give-away, as you may be sure he will be keeping careful observation at all times.

The use of supporting riflemen concealed in trees must not be revealed by the scratching of bark or breaking of surrounding vines when the riflemen assume their position. Cigarette butts, paper scraps, ration tins, footprints, and bruised or broken vegetation are positive indications to keen enemy eyes that all is not well.

The use of one or two native guides to assist in the concealment and to remove all traces after the occupation of the position is desirable when possible, as they have great natural ability along this line.

The glint of metal surfaces is often a sure give-away of otherwise perfectly concealed positions. The use of lusterless paint on bright metal, when not impeding the function of the weapon, overcomes this problem. The use of green paints with high yellow content should be used for daubing of weapons, clothing, and equipment. Green paint in which the blue content is high must be avoided, as it is an unnatural jungle color.

Depth. By depth of ambush is meant the distance which the enemy may penetrate into the position before his leading element passes out of the line of fire. This depth depends upon the size of the enemy party that is to be trapped. When the enemy is fully in the position, there must be fire both in front and behind him to prevent his escape from either direction. The depth will depend, as well, upon the location of the ambush and its type.

It must be remembered that the principle of ambush is the annihilation of the entire enemy group, and depth must be governed accordingly.

Field of Fire. It is seldom possible to so place weapons in an ambush as to make use of the optimum field of fire for each. No attempt should be made to place weapons in such a way as to maintain the so-called correct range. Instead, the weapon should be brought closely into the ambush in order to bring point-blank fire to bear on the enemy if possible. It is certain that the bullet is just as effective, and the attendant roar of weapons adds to the confusion of the enemy who more often than not gives up the idea of escape as a result.

Route of Withdrawal. A successful ambush is sure to cause an attempted enemy reprisal—especially, if one or more of the party escapes and can give accurate location of the ambush. Consideration, therefore, must be given to the easiest and swiftest means of withdrawal directly after the operation, or a return ambush by the

Acme

The Guadalcanal natives are eager to help U. S. troops. Here is one serving as a guide, while others assist with supplies.

enemy may result. This is of even greater importance if the ambush is behind enemy forward lines or in an enemy area, as it often is. If possible, two or three routes of withdrawal (none of which is the route of entry) should be reconnoitered carefully prior to going into position. Care must be taken in conducting this reconnaissance, as the enemy may well back-track and ambush your very route of withdrawal. Here again, native scouts or guides should be used to cover tracks and search for the best routes.

Assembly Point. Even the most careful preparation and planning of an ambush operation may be frustrated by an active and clever enemy; and, as often occurs in jungle combat, the tables may be turned with startling suddenness. When this takes place, groups or even individuals may find themselves cut off and forced to retire. If care has been taken to designate an assembly point, with the positive assurance that all know its exact location, a reorganization may be effected quickly enough to insure rapid aid to those caught behind, or even another turning of the tables that will result in the destruction of the enemy.

Protection Against Ambushes. The Japs are active in back-tracking enemy patrol routes through the jungle and often place ambushes pending the patrol's return. In light of this, it is mandatory that tracks be concealed, insofar as possible, by eliminating unnecessary footsteps, prohibiting smoking or reëntry into our lines by a different trail.

The use of native scouts as points for patrols along trails where ambushes may be anticipated, more often than not, will disclose such ambushes (through the scout's inherent keen eyesight) in time to prevent the patrols from falling into the trap. The use of native scouts in patrol operations, when they are available, cannot be too strongly stressed.

Patience

"Patience is not only a virtue—it's the mother of all virtues in this kind of job!"

Not much can be said on *how* to inculcate patience in troops operating in the jungle. Much, however, can be said on *why*. A lot has been heard about the ability of the Jap to remain motionless in one spot for long periods of time while waiting for a suitable target to appear. The soldier, fighting in the jungle, must also develop that same ability.

"Haste leads to waste" of life in jungle fighting. The patrol that crashes its way along, intent on making speed is just hurrying into trouble. The noise alone is bad enough. The patrol that moves slowly but steadily, advancing with stealth, with eyes probing each foot of ground covered, ready in an instant to fade into the bush or to take decisive action if the occasion arises—that is the patrol that will gain the most information or do the most damage. The man in the ambush group that must peek around the bush to see how far the enemy has entered the trap—that is the man who gives everything away and causes the death or injury of some of his companions. A good hunter must have patience, and in jungle combat the soldier is a "hunter" in the strictest sense of the word.

ARMORED TACTICS IN NO

TANK WARFARE in the Western Desert, extending from the Nile Delta in Egypt across Libya to Tripoli, has passed through three phases. During these phases, the tactics employed by the British Army have been modified as the tactics and equipment of the enemy have changed or developed.

First Phase—Tanks Against Infantry December, 1940-March, 1941

When General Wavell attacked Marshal Graziani and his Italian Army on December 9, 1940, he had a handful of out-of-date British Cruiser tanks, and a new infantry tank called the Matilda, which was a slow, heavily armored vehicle that carried a two-pounder gun. The Italian tanks, judged by modern standards, were poorly equipped and badly manned. The new British Matilda was really the deciding factor in the campaign, for the Italians had no first class antitank guns to bring against it, and no good tanks; and in the part of the desert where the fighting took place, tanks were absolutely vital.

The great flat spaces of the Western Desert give plenty of room for enterprise in maneuver. There is no position that cannot be outflanked by tanks. The British heavy armor over-ran the Italian fortified lines, while their lighter units, operating around the desert flank, were able to get to the "soft-skinned" vehicles and burst in among the transport convoys like wolves among a flock of sheep.

The climax of Wavell's campaign came when the 1st Battalion of the Royal Tank Regiment, with detachments of the 7th Armored Division, cut across the desert from Makili to Beda Fomm, a distance of nearly 150 miles, and intercepted the head of the Italian column retreating southwards from Bengasi.

By this time, the long distances and bad going had reduced the number of tanks available, and the battalion's armor consisted of only 8 Cruisers, and a few lighter tanks.

The enemy started the battle 20,000 strong, with 2,000 lorries and 148 tanks. Part of the British battalion, with the 8 tanks, took on the 40 tanks that formed the Italian vanguard, and by nightfall had disposed of every one of them without loss to themselves. This success seemed to paralyze the enemy, and it was not until the next morning that he pulled himself together sufficiently to come forward again. The British force, by this time, had been reduced by the mechanical failure of 2 tanks, but the remaining 6 tanks confidently set about the Italians, and after an hour's fight drove them from the field.

Soon after this, British reinforcements arrived, and the whole Italian column was compelled to surrender. This marked the end of the first phase in the development of British tank tactics, which may be described roughly as "tanks against infantry," for the inferior quality of the Italian tanks had rendered them almost negligible. But the campaign was not over.

During the "First Phase" on the Western Desert, British guards move up protected by a smoke screen and Matilda tanks. The Matilda was an infantry tank mounting a 40mm gun.

Superior German Fire Power Dominates British Armor

German assistance for the Italians was pouring into Tripoli, and in March 1941, Rommel and his *Afrika Korps,* which included 2 panzer divisions armed with Mark III and Mark IV tanks, were in the field.

These tanks were far superior to any that the British had produced up to that time. The Mark III mounted a 50mm gun and the Mark IV a 75mm gun. Both of these guns were effective up to a range of 1,500 yards, and these well armed tanks were supported by a gun, which for a time seemed likely to prove a decisive factor in the desert. This was the German 88mm, dual-purpose gun that now appeared in Libya for the first time.

In the face of this new development, the British, with wornout armor and at the end of a long line of communication, were forced to withdraw. They were vigorously pursued, but managed to reëstablish a defensive line just inside the Egyptian frontier. This left the closely invested port of Tobruk in a precarious position, 90 miles behind the enemy lines.

For the next five or six months, during the heat of the Egyptian summer, nothing spectacular occurred. Both

'H AFRICA

by Major C. B. Ormerod
Royal Artillery, Retired

General Sir Bernard L. Montgomery, Commander of the British Eighth Army during its successful "Third Phase" has chased Rommel across 1700 miles of the Western Desert.

A column of U.S. General Stuarts (M-3), mounting 37mm guns, advances during the "Second Phase."

sides made extensive preparations for a renewal of the battle, and Tobruk still held out firmly, but at a not inconsiderable cost.

Second Phase — Tanks Against Tanks
November 18, 1941-December 25, 1941

The next phase opened at dawn on November 18, 1941, when General Sir Claude Auchinleck, who had replaced Sir Archibald Wavell as the British commander in the Middle East, attacked in force.

Before the attack opened, the enemy force in Cyrenaica is believed to have comprised the German *Afrika Korps* (the 15th and 21st Armored Divisions, and the Italian 55th *Savona Infantry*), located roughly in the area Bardia—Sollum—Sidi Omar; the Italian 21st Corps (3 infantry divisions) with a stiffening of German infantry, located in and around Tobruk; the Italian 10th Corps (the *Ariete* Armored Division and 2 motor divisions) in reserve in the area of El Adem—El Gobi—Bir Hacheim, to the south of Tobruk. In all, it was estimated that the Axis had 387 tanks, apart from old models and very light tanks.

The Axis air forces in Cyrenaica were believed to amount to 150 German and 200 Italian aircraft, to which must be added about 100 aircraft in Tripolitania, and 200 in Greece and the Aegean that might be called on to intervene in the fighting.

Details of the composition of Auchinleck's force are not available, but it is assumed that the strengths of the opposing armies were about equal, though the British seem to have had a slight superiority in the air.

The British also had some new weapons. Large numbers of U. S. Stuart tanks had arrived, and in addition to the original Matildas, there were Valentines

and Crusaders. Each of these mounted a two-pounder gun, effective up to about 800 yards, and excellent at short ranges. Supporting these tanks were quantities of two-pounder antitank guns mounted on lorries, and 25-pounder field guns, which were first class weapons but not suitable for use as true antitank guns.

As soon as General Auchinleck launched his attack, his tank commanders realized that they were outgunned. The German guns were hitting them before they could get close enough to make any reply. The only possible course of action for the British, therefore, was to charge and close the distance to 800 yards, or less, at which range their two-pounder guns could reach the enemy. These tactics proved effective, but costly.

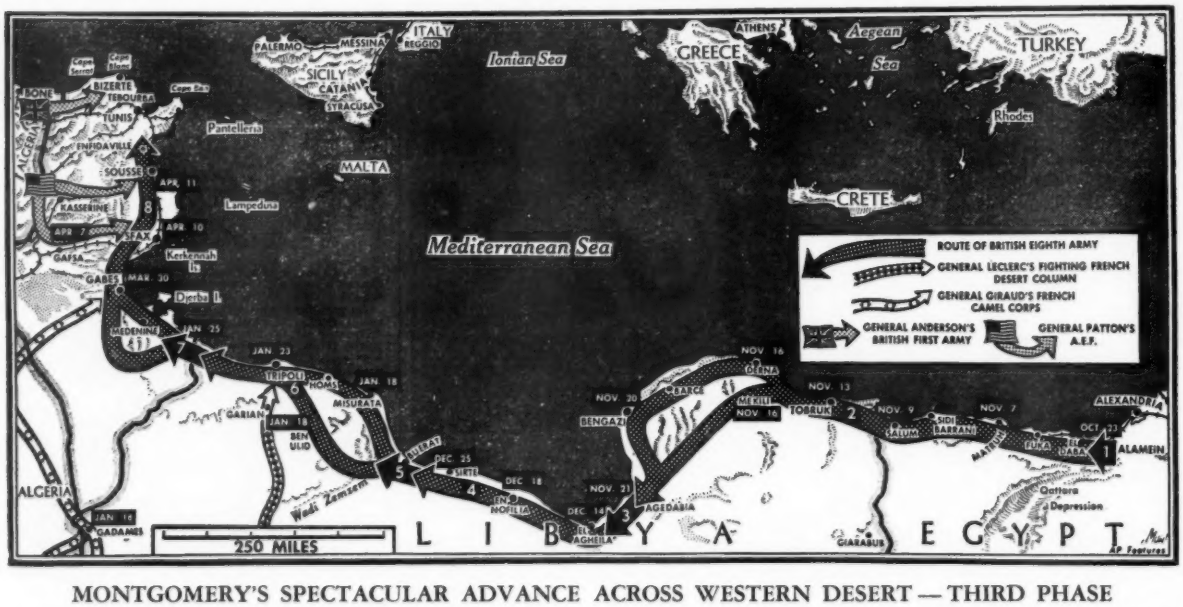
After ten days of desperate fighting, the remnants of the Axis armor finally made off across the desert, and left the garrisons of Halfaya Pass and Bardia to their fate. Tobruk was relieved, and on Christmas Day the British once more were in possession of Bengasi. Rommel and his panzers meanwhile had established themselves at El Agheila on the Gulf of Sirte.

In this first great battle of tank against tank, the battle ground was a tactician's paradise in which neither side had any permanent or definite advantage of terrain. Territorial gains, save for reasons of immediate military strategy, were unimportant, and the commanders of the opposing armies had one object only: to batter out of existence the armored forces of the enemy.

The massed forces approached each other like two fleets at sea, with their attendant escorts of armored cars and with supply and repair vehicles in close attendance. They closed, fought, broke away, and went into *laager* for the night, often in sight of each other.

Every advantage was taken of folds of the ground, dust clouds, smoke screens, and of the rising and setting sun. The lighter British tanks, fighting often on the move, tried to close the range; while the heavier Axis vehicles backed slowly away or maneuvered to a flank in an effort to maintain the distance which gave the advantage to their longer range guns.

The enemy killed and wounded in the first part of this campaign were given by Mr. Churchill as 24,500, but this figure included the infantry casualties in the fighting around Halfaya Pass and Bardia. Prisoners numbered 36,000, while British losses were put at 18,000. But the campaign was not yet over.



MONTGOMERY'S SPECTACULAR ADVANCE ACROSS WESTERN DESERT — THIRD PHASE

1. October 23-November 4. General Montgomery coördinates aerial and artillery barrage with infantry and tanks to crack Rommel's El Alamein line in 12 days.
2. November 4-November 21. Rommel runs, abandons Italian troops. Montgomery follows him 700 miles nonstop into Agedabia, wiping out all rearguard stands.
3. November 21-December 12. First lull. Montgomery halts Eighth Army to regroup, bring up heavy guns and armor against expected Axis stand at El Agheila.
4. December 12-January 2. Montgomery strikes, cracks Rommel's surprisingly light defenses. Desert Fox flees, to Miserata. Huntsman Montgomery hounds his trail.
5. January 2-January 16. Second lull while Montgomery hurries his big guns to the new front before Wadi Zem-Zem, where Rommel seems to be ready to fight.
6. January 16-January 25. Rommel chooses to run for cover behind the Mareth Line in Tunisia. General LeClerc's Fighting French column joins the British Eighth Army.
7. January 25-March 18. Third lull. Montgomery rests his army before Mareth Line while weather, French politics clear. Yanks and First Army push deep into Tunisia.
8. March 18-May 8. The final push. Eighth Army flanks and cracks Mareth Line. Anderson, Patton and Montgomery join forces for the big squeeze.
9. May 12-. Final surrender of Axis troops in North Africa.

Churchill tanks, fitted with 6 pounder guns, were another surprise for Rommel during "Third Phase" in North Africa. Here are some of them moving forward to the battle area.

Loss of Tanks Precedes Withdrawal to El Alamein

The British, in preparation for a further advance towards Tripoli, had established large forward dumps at points southeast of Bengasi. Before the British were able to prepare an adequate defense in this region, however, Rommel, who had been reinforced with both men and tanks, struck again in March 1942. By this surprise move, he captured or destroyed all supply dumps, retook Bengasi, and drove the British back to the line El Gazala—Bir Hacheim, where the position became stabilized for some months.

The British position was a strong one, about 45 miles long with one flank resting on the sea, and the other at Bir Hacheim in the waterless desert. It was protected by an extensive minefield, which played an important part in the battle that took place in this area in June of 1942.

Rommel attacked on May 26, 1942. He sent the bulk of his armor in a wide sweep around the desert flank and then had it turn northwards behind the British minefield. The force was to cut across the lines of communication, disorganize the rear areas, and possibly take Tobruk.

Again the fighting was very furious and costly, but it was now less a matter of tank against tank than a case of tank against infantry and artillery. At one time, it seemed as if Rommel's armor would be pinned against the back of the British minefield and destroyed. But after nearly three weeks of bitter fighting, it was the British armor that was overthrown. The Eighth Army was forced to retreat, and Tobruk was captured.

It is impossible to say exactly how many British tanks were lost in this battle, but it was stated in the House of Commons on September 8, 1942, that the Eighth Army lost 200 tanks between the 12th and 18th of June. No army has yet been able to stand in the desert once its armor is gone. The infantry must retire, and the quicker the better. Once this point is appreciated, then the rout and retreat of every army in the desert—Italian, German or British—is explained.

With one exception, there is no defensive position in the Western Desert, because every position can be outflanked. The exception is the El Alamein line, which is unique because it is securely based on the sea at its northern end, and on the quick-sands and broken country of the Qattara Depression in the south. It was to this line that the British Eighth Army, with depleted and weary forces, retired from El Gazala, when their tanks were gone.

This may be regarded as the end of the second phase, where tanks had fought chiefly against tanks.

A Crusader, mounting a 6 pounder gun, and two U. S. General Sherman tanks (M-4) shown entering Mersa Matruh during the early part of the "Third Phase."

Third Phase—Antitank Guns Spearhead Attack; Armor Exploits, August, 1942-April, 1943

When the third, and final, phase of the fighting began in August 1942, the British Eighth Army had been reëquipped, and, to a great extent, rearmed. The U. S. Sherman tanks with their 75mm guns were now a match in range and armor for the best tanks that Rommel could muster, while the British six-pounder antitank gun in the hands of the infantry, and also mounted on the new Crusader tanks, had reached the front in large numbers. It was no longer safe for tanks to try to over-run unbroken infantry.

The battles from this point onward show the infantry as the spearhead of the attack, with the armor, like cavalry, held back and waiting to exploit any success. The factors that led chiefly to this change were the employment of good antitank guns by the infantry, the increased use of landmines, and the power and accuracy of the field artillery.

Rommel does not seem to have realized these changed conditions when he attacked the El Alamein position with his armor on August 31, 1942. He ran into a heavy concentration of antitank and field artillery fire, and after being bombed all night and shelled all day for three days, he broke off the engagement and retired again behind his own minefields.

In this action, the Nazis had produced nothing new in the way of either equipment or tactics. It remained for the British Eighth Army, under its new leader, General Montgomery, to show how the new methods, which had been evolved, could break the deadlock that had apparently developed at El Alamein.

Artillery, engineers, and infantry fought their way through the enemy minefield, which was very extensive and of extreme complexity. Rommel knew what was coming and expected that Montgomery would attack his center, which was the weakest part of his line. He divided his armor, therefore, and placed it behind both his northern and southern flanks, so that when the British armored spearhead came through, he planned to crush it by converging attacks. This decision proved to be his most costly error, for Montgomery, instead of attacking the weakest part of the line, sent his infantry against the strongest northern flank. When a breach had been made, the British armor poured through the gap and met and almost annihilated the Axis panzer divisions in a great tank battle at El Aqqair on November 2nd, when about 260 German and Italian tanks were destroyed.

But for a break in the weather, it is probable that not a single Nazi tank would have escaped. The pursuit was pressed without a pause, while the air forces kept up a continuous bombing attack on the retreating columns. Rain, however, rendered parts of the desert impassable, and the Nazi rearguards sowed minefields thickly along the roads as they retired.

The difficult terrain prevented the British from pursuing the Germans along lines parallel to their retreat. Rommel was able, therefore, to escape encirclement during his long 1,700 mile trek from El Alamein to northern Tunisia. But whenever he halted for any time, the British armor was always able to work around his desert flank and force him to continue his "withdrawal according to plan." Finally, with his back to the sea, eventual surrender is inevitable.

The Royal Armored Corps

The evolution of tank tactics from brute force to skilful maneuver and expert gunnery has been interesting. The British Royal Armored Corps has combined the old British cavalry regiments, now mechanized, with the Royal Tank Regiment. To these must be added the territorial cavalry regiments, or Yeomanry, which have also been mechanized (some as mobile artillery), and now form a part of the Royal Armored Corps.

The Royal Armored Corps is organized on a cavalry basis, into troops, squadrons and regiments. Various types of tanks, armored cars, and Bren-gun carriers, are included in each regiment. An essential part of the training is done with small, highly mobile columns, which, in addition to the tanks, include artillery, engineers, antiaircraft and antitank guns, and motorized infantry. Such columns have their own coöperating aircraft assigned to them. When operating independently, these small combined forces are always commanded by the senior officer of the armored units, even though some of the infantry, artillery or engineer officers may be of higher rank.

The open desert has developed its own type of tank warfare. It remains to be seen how far the strategy and the tactics evolved in Libya will apply in the more complex terrain of Europe.

Fighting French at Battle for Gabes*

WHEN, at dawn on March 29th, the New Zealanders under General Freyberg started their successful drive in the valley from El Hamma to Gabès, the hilltops and the hillsides suddenly became alive. From their concealed positions, the Fighting Frenchmen under General Leclerc arose to take their part in the decisive battle of southern Tunisia.

In the valley three hundred yards below, two dozen heavy and middleweight tanks—Crusaders, Shermans and Grants—were moving forward in the midst of a sandstorm, which at times concealed the operation. Through the clouds of dust, one could see the flashes from the guns. Groups of Kittyhawks hedge-hopped over the enemy lines, and overhead, squadrons of Spitfires protected the battlefield from the intrusion of enemy fighters and bombers. The troops of General Leclerc were on the march, protecting the flank of the New Zealanders.

In the general plan of the operations (which were to lead to the victory of El Hamma), the objective given to the Fighting French troops was to dislodge all of the enemy posts and batteries from their positions on the hillcrests of Djebel Melab and Djebel Tebaga, from where they could stop the allied tanks progressing in the valley.

These desert troops, which had come from Chad and conquered Fezzan after long-distance treks, were now asked to progress across chains of mountains cut by deep ravines. There was no question of using trucks to carry field pieces; every one of them had to be placed in position by manpower.

Along this ancient invasion route, the Axis defenses were fastened to a wall dating from the days of the Romans. Their positions seemed almost invulnerable; but after a furious three-day assault by the volunteers of General Leclerc, the Italians gave up and it was surprising to find that among the prisoners were men of the same units that had previously been routed at Ugh El Kebir and at Um El Araneb. The French artillery concentrated its fire in the valley on German tanks trying to impede the New Zealanders' attack. At night, Junkers 88's repeatedly attacked the French positions, and three planes were brought down by anti-aircraft units.

The next morning, Axis troops made a desperate effort to reoccupy their former positions, and Rommel sent forward Italians and some of his best German shock troops for this purpose. After a violent artillery preparation, they made the assault, and soon the fight became a hand-to-hand combat. From all the French outposts, men could be seen counterattacking with grenades or throwing back the enemy with bayonets into the ravines below.

Many enemy dead were left on the ground. All the prisoners taken were young men of twenty, already veterans in this war. They had come from Russia, where they took part in the winter campaign, and had arrived in North Africa only a few weeks before. All of them were surprised to discover that they were captured by Frenchmen. One of them summed up their surprise in these words: "Ever since 1940 we have kept French prisoners in Germany thinking that we had liquidated France. And today, two and a half years afterwards, we in turn are made prisoners by Frenchmen. This war will never end."

Later, the Fighting French motorized units of General Leclerc paraded through Gabès side by side with the victorious troops of General Freyberg.

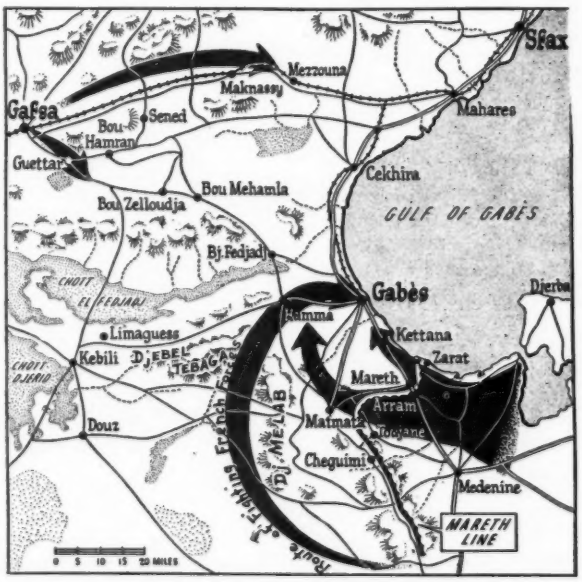
At Gabès a group of Frenchmen received General Leclerc, and several officers from his unit. On the floor of the room, whose windows were without glass and whose ceiling was cracked, mimosa flowers made a Cross of Lorraine; the same symbol had been embroidered in red on the flag of the Veterans' Association of Gabès, carefully concealed and kept since 1940 and today flying once more.

The Mayor of the township welcomed the General:

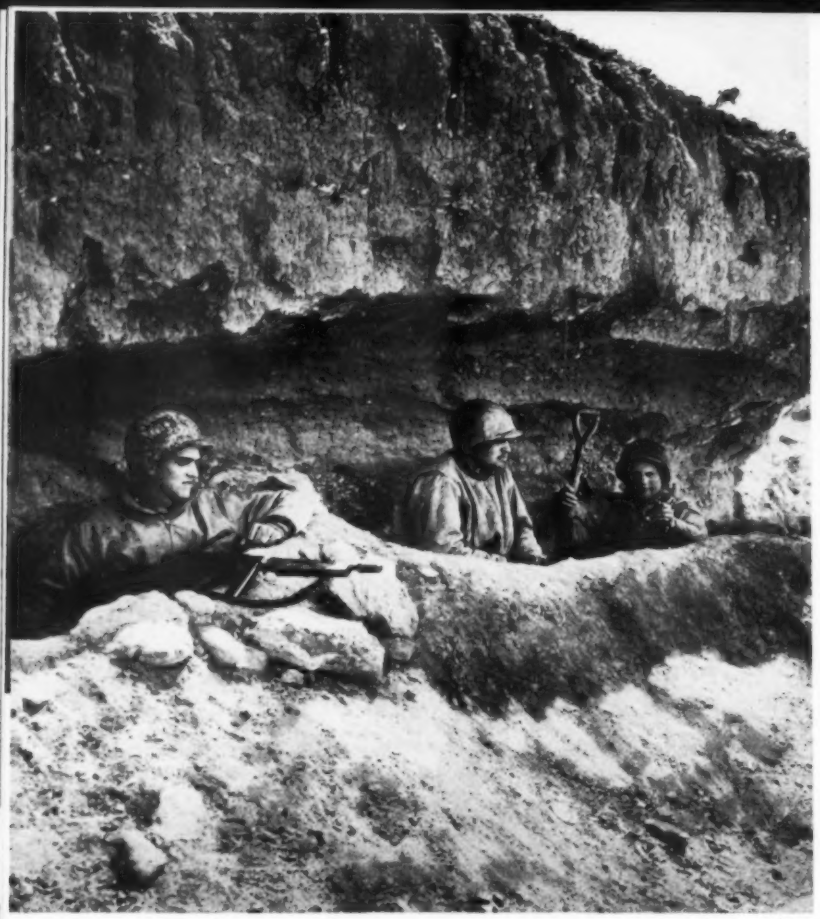
"Perhaps we have suffered less than you," he said, "but we offered our sacrifice in the same spirit as yours."

In his reply General Leclerc emphasized the joy felt by the Fighting French Forces when they entered Tunisian territory. "From Chad and French Equatorial Africa," he said, "we counted the steps. First, North Africa, then France as far as Strasbourg; when we reached here, we felt that we had taken the first step."

*By wireless from Tunisia to the Fighting French Delegation in Washington. Under General Leclerc, the Fighting French forces recently came up from Chad and are now in operations with the British Eighth Army.



Trap for Rommel: Arrows indicate converging Allied attacks in Tunisia.



"Foxhole" in Tunisia. These three men from a tank destroyer take cover in the bank of a hill while waiting for action at El Guettar Valley. When the order is given they will dash out to their machine for a crack at enemy tanks.

Acme.

U. S. Soldiers Help Swee

With the bare brown hills of Tunisia serving as a somber backdrop, American medium tanks move up to the front in El Guettar Valley. Fighting for Bir Marbott Pass, the Americans forced the Nazis into rapid retreat up the road toward Gabes.

Acme.

Acme.

"Sweating out" enemy snipers, a patrol of U. S. soldiers advances cautiously through the streets of Maknassy. The 19 men took the town, from which the enemy had fled.

...ene Axis

...from Tunisia

An American sapper is shown holding an Axis mine, which he has just dug from the sand near Gafsa. It was necessary to draw these Axis "fangs" to permit the advance of U. S. forces.

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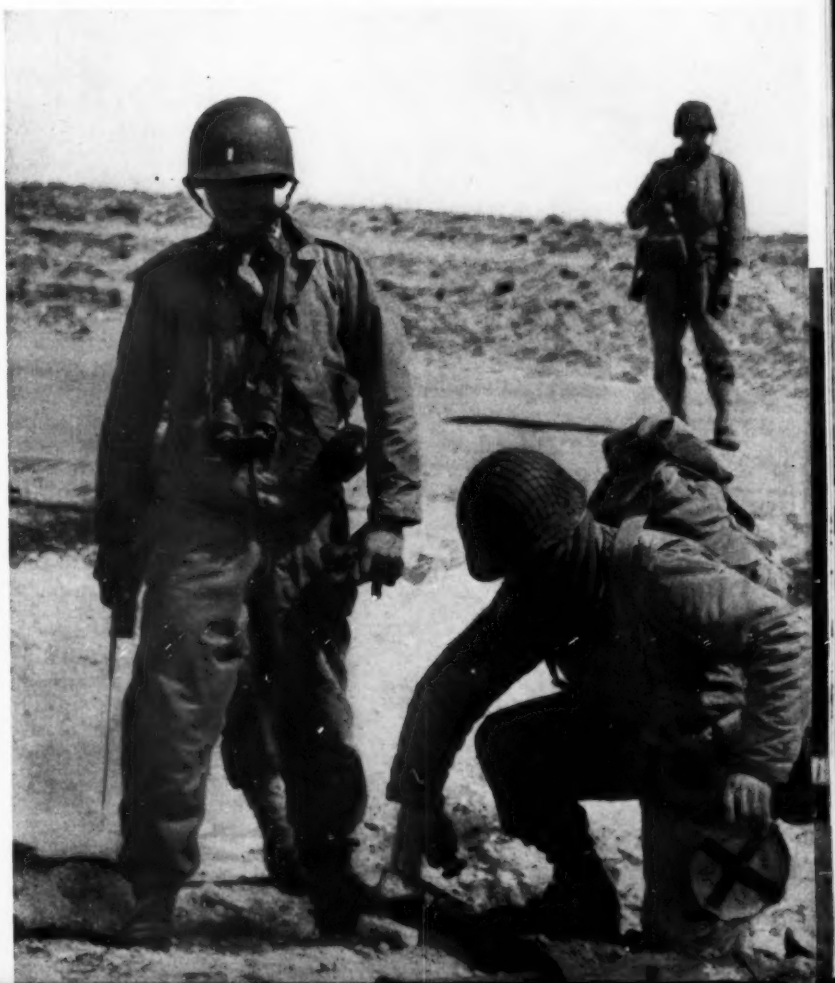

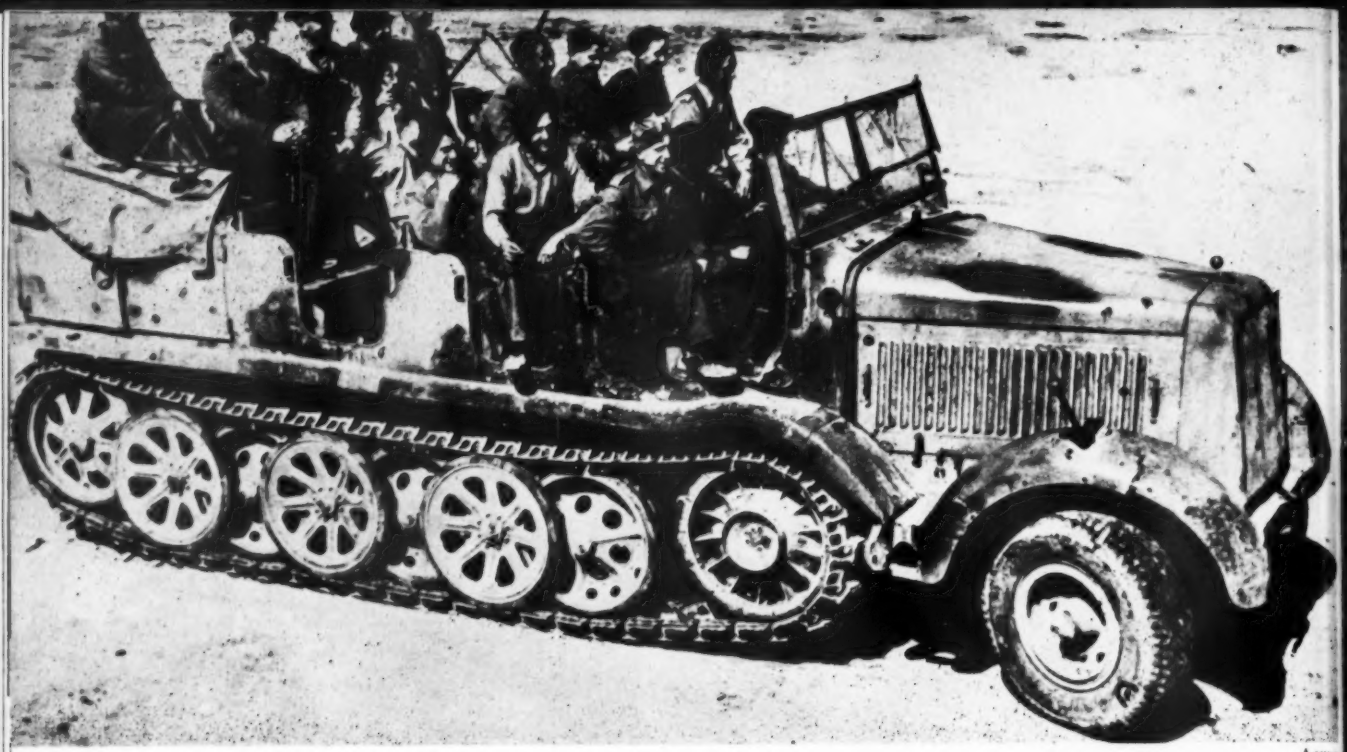

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This German Mercedes-Benz half-track troop carrier and prime mover was captured by British soldiers of the Eighth Army.

Captured German Matériel

A U.S. star has been painted on this captured German tank destroyer and it is now being used against the enemy. This fast armored vehicle is equipped with a 75mm gun from the Mark IV tank and has dual controls for operation forwards or backwards. The tank was taken in a battle with the 10th Panzer Division in Central Tunisia.

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European.

This German 88mm (FLAK 18/36), shown in ambush, can also fire from wheels. In the above picture, the front wheels, placed in gap in revetment, are ready to be run towards gun and hitched on. The tripod-like travelling lock in place indicates that the gun was preparing to run. White rings on barrel represent number of planes and tanks knocked out. Soldier in foreground is examining gun shield. Ammunition is stored to right. Beneath the empty gun cases can be seen the remnants of tarpaulin and net used for camouflage. Sand bags on the tarpaulin served both to hold down the sand and to keep the tarpaulin from blowing away when the gun fired over it.

This German He 111K night bomber, captured intact, is being examined by American soldiers. No explanation is given for the lettering. "D (Deutschland)—ACLO" represents a commercial license. Machine gun is fitted in nose, and beneath the right propeller blade can be seen the "blinders" for black-out flying.

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Fuselages of damaged Italian monoplane fighters were left in this Eucalyptus grove near Tripoli. Wings and motors had been removed, probably for use in other planes.

Photograph at left shows two American sergeants examining an Italian gun captured during the successful American counterattack at Kasserine Pass in Tunisia, February 22nd-23rd. It is a 20mm AA-AT gun.

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This Italian 105mm field howitzer with its tractor was captured by rapidly advancing American troops in Tunisia. The tractor wheels are equipped with grousers that roll out for use in deep mud or sand. In background (behind gun) is the U. S. armored car that made the capture.

Captured Italian Matériel

This Italian tank, captured by Yanks at Kasserine Pass, is a 13-ton, 1940 model (M 13/40) and mounts a 47mm gun in turret.

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Trained Guerilla Troops

Behind the Enemy Lines

by Captain Douglas M. Smith, French Foreign Legion

Between Jalo and Bengasi—450 miles behind the enemy lines.

GUERILLA WARFARE by trained troops is a highly specialized military function of modern total war. It is not to be confused with civilian bands or rebel groups of guerillas who operate without authority from the main armed forces. It is, rather, a phase in *trained armed warfare* that concentrates on destruction of enemy personnel and equipment in the enemy's own territory.

Small guerilla units, made up of specially selected men from various branches of the army, can and have performed missions behind the enemy lines that are of inestimable value. Operating with daring, precision, and coördination, these units have destroyed great quantities of matériel—men, guns, tanks, and grounded planes.

Activities in Libya

In Libya in 1942, a guerilla unit, made up of highly trained British and Fighting French volunteers who operated under the command of the British Headquarters Staff, executed many daring missions behind the enemy lines. They continually penetrated enemy positions, harassed supply routes and destroyed airdromes, munition dumps, gasoline stores, railroad tracks, depots, and communications.

One of the most valuable accomplishments of the guerillas in Libya was the destruction of planes and airdromes. The usual method of attacking an airdrome was for the men to leave their cars and go on foot up to the airdrome at night. When possible, they passed the sentries without detection and put their bombs on the planes, then left the airdrome, and got sufficiently far away to pick up their cars before the bombs went off. Of course, this was not always possible, and many times, sentries had to be killed in hand-to-hand fighting

Captain Smith stands at the head of a line of jeeps just before they reached an oasis on the Libyan desert.

or else by a sudden attack with a knife. If the guerillas were detected, a part of the group would hold off the attacking enemy forces, while the rest of the men continued to destroy the airplanes. In a case of this kind, they used the 32-second fuses rather than the long time fuses.

Although the Germans made every effort to protect their planes against such attacks, approximately 300 enemy planes were destroyed by this guerilla unit during a single 12-month span. For the same period, there was only one foray recorded when the men were not able to reach and destroy at least 50 percent of the planes.

Guerillas were also trained to dispose of transport columns at night by driving along side them and firing from machine guns with incendiary shells, which not only killed the personnel, but set the trucks on fire.

Most of this guerilla activity was conducted at night so that *efficient night firing* of machine guns and small arms was very important.

Guerilla units in Libya sometimes worked from three to six weeks in enemy territory, and on one occasion penetrated as far as 700 miles behind the lines. During this particular operation, which took place in August and September of 1942, they travelled across the Libyan desert for a total of 1976 miles and worked in and around the German patrols until they reached Bengasi.

This trip was executed by approximately 250 men in 52 jeeps and 42 three-ton trucks, which had to be dug out of the sand anywhere from three to eight times a day. Some days the group covered as much as 100 miles in 16 hours; other days, only 16 miles. The rate of speed depended largely on the terrain and the amount of extremely soft sand encountered. In many places, the terrain was so difficult (either soft sand or rocky, hilly country) that, except for the discipline and training of the men, the hardship of keeping the vehicles rolling would have made it impossible to continue.

On such forays, there were always two or three prearranged places to meet, and if the vehicles were destroyed, the men were to make their way to one of these meeting places on foot by compass.

En route to Bengasi, a base rendezvous was established in an area affording the best protection possible. There were no buildings and no trees, but a certain amount of scrub and some low bushes helped to camouflage excess equipment and the few men left on guard. From this rendezvous, the line of jeeps and trucks moved out under cover of darkness on the last phase of their mission.

Before reaching Bengasi, the raiding party spotted a small Italian outpost fort. Three officers and six men of the guerillas were dispatched in three jeeps to dispose of this group. They made their way to the base of the hill on which the enemy outpost was located and worked up with the jeeps for as far as possible. While their movements were carefully noted by the Italians on the hill, the men in the jeeps continued their activities with no apparent concern, and from time to time waved nonchalantly toward the enemy. In the deepening dusk, the impression given was one of friendliness.

As the guerillas neared the fort on foot, however, they separated and were soon fired upon. Returning the fire, they quickly drove the Italians behind their barricade and proceeded to attack. Then, using hand grenades to good advantage, they stormed the fortification and killed eight of the eleven occupants. After taking what papers and documents were available, they demolished the outpost and took the three remaining men as prisoners. The guerillas then withdrew and made their way back to the rendezvous. Two of the officers, seriously wounded in this operation, had to be left behind, but the main guerilla party continued toward Bengasi.

The Bengasi raid was to have been made in conjunction with attacks by two other guerilla units on Jalo and Tobruk. Had the Germans not had previous information regarding the coördinated attacks, it would have been possible to have captured these three main

THE AUTHOR

Captain Smith, a specialist in trained guerilla warfare, has recently rendered valuable service with guerilla units in Libya under the command of the British Headquarters Staff. Although serving with the French Foreign Legion, he is an American citizen, descended from a long line of fighting Americans. His forebears participated in the French and Indian Wars in 1758, the American Revolution, and the Civil War.

After graduating from Lawrenceville Preparatory School in New Jersey, he attended the University of Pennsylvania until 1916, when he left to join the Allied cause in France. There, he was graduated from* L'Ecole Militaire d'Artillerie *at Fontainbleau and served during the First World War as a lieutenant of the French Foreign Legion, detached to the 25th* Regiment d'Artillerie d'Campaigne *(75mm guns).

Following the war, Captain Smith returned to America where he remained until after the fall of France. In 1941 he rejoined the French Foreign Legion under the Fighting French, and was immediately detached for guerilla operations with the Djebel Druse tribes (Arabs) south of Damascus. Since 1942, still on detached service from the Legion, he has devoted all of his time to trained guerilla fighting with the British and Fighting French behind the German lines. For his services in Libya, he was recently awarded the* Croix de Guerre *with Palm.

Captain Smith and his jeep loaded for the trip to Bengasi. Machine guns, heavily wrapped to protect them against dust, are packed just above the camouflage net.

German garrisons forming the points of an isosceles triangle. In addition, a big portion of Rommel's reserves could have been encircled.

This was the longest operation that the Libyan guerillas ever made, and it proved that there was no limit to the time or distance of their forays, or the numbers involved.

After the fighting at Bengasi, about half of the party walked the entire distance back to the base rendezvous on foot. Some were fortunate enough to pick up transportation after the first 18 to 25 miles.

It must be borne in mind that all of the men were volunteers for this type of work and realized fully the conditions under which they were to fight. Of the wounded that were brought back, not one complained in the slightest, even though in most cases they had little or no morphine with which to deaden the pain.

Personnel

Successful trained guerilla operations depend largely upon the leader and the selection and training of his men. While the leader cannot be with all of the groups, he can so plan the work that they can operate in and over a large territory, and come together or separate as conditions warrant. He must have an excellent knowledge of enemy military tactics; he must be able to use his men advantageously in any type of country; and above all, he must be a *leader* of men.

The next most important thing in this type of warfare is the selection of personnel. All of the men, as well as the officers, must be volunteers. They must be individualists—men who are accustomed to living and thinking for themselves and acting independently of the thoughts and ideas of others.

They must have initiative, daring, and the ability to suffer or inflict punishment with equal sanguineness. This does not mean the gangster type of hoodlum, but rather a person of determined courage who can act quickly and with self-confidence under the most adverse conditions.

In the training of the volunteer guerillas who operated so successfully in Libya, every effort was made to build up a tremendous degree of self-confidence and self-discipline. Consequently, disciplinary action was rarely necessary.

Even after the most careful process of selection, however, it is not always possible to pick perfect men for the arduous assignments necessary. In many cases, this does not become apparent until after a man has been on an actual operation. In Libya, the guerilla unit was the only one that had the privilege of returning officers or men to their original units without censure or explanation. In this way, men unsuited for this specialized type of work were constantly weeded out.

Equipment

The next important thing in a guerilla organization is the type of equipment that the men must have to fight successfully inside enemy territory. Equipment in Libya consisted of American jeeps and three-ton trucks. Each jeep had 4 mounted machine guns and, in addition to many thousands of rounds of cartridges, carried 16 drums loaded with ammunition. Each jeep also carried hand grenades, tanks for water and additional gasoline, and sleeping equipment for three men. Extra supplies of fuel and ammunition were carried in trucks.

One of the most important weapons for trained guerilla warfare is the Maxim silencer, which enables the men to take care of sentries without any noise and makes it possible at the same time for other groups to kill the personnel in barracks with a minimum of commotion.

As soon as a guerilla party returns from operations, all fighting equipment is turned in and specially trained personnel (other than the fighting group) attend to putting this equipment back into first-class condition.

Training and Discipline

Speaking in the broad sense, guerillas are trained in all types of demolition warfare, although expert engineers with the groups take care of and assist in the working out of any major demolition work that might be undertaken.

All men, of course, are trained in unarmed combat so that they are able to handle guards and sentries without resorting to their arms. They should also have a fundamental knowledge of navigation (by compass) and map reading; that is, they should be able to read a compass fairly well. Although trained navigators should accompany each group, even when operating in terrain other than the desert, compass reading is essential because of the night work.

A great difficulty in trained guerilla warfare is keep-

ing the men firing low, and this is particularly true during night operations. Much time and munitions were used, therefore, to make men efficient in firing machine guns and small arms at night.*

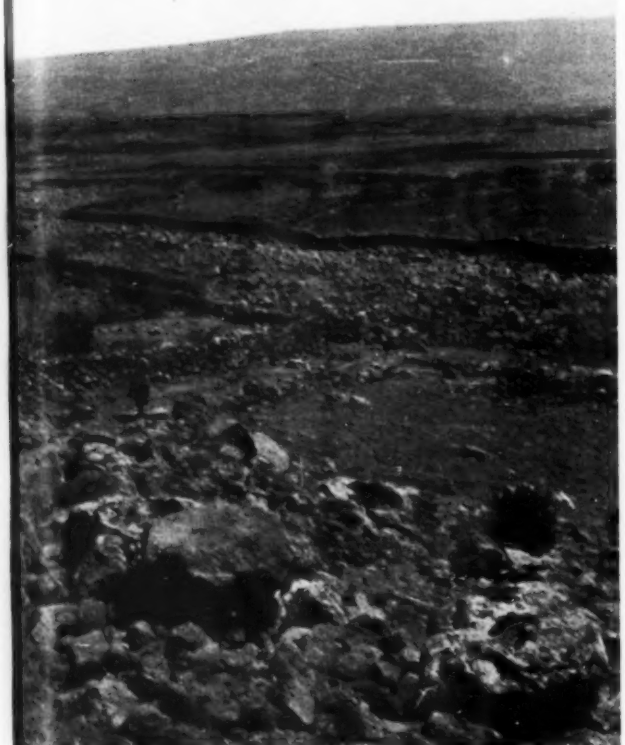
During the stay in camp, the men were permitted to draw ammunition at will to go out and continually practice firing, both small arms and machine guns. There was never a night that the guerillas were not out night-firing.

The next important thing in an organization of this kind is the discipline, which must be very strict and rigid in every detail, not only regarding military training but also the personal control of each man over himself.

Men should be taught to go for long periods without a great deal of food yet still keep in perfect fighting condition. During training, our guerillas were taken on long night marches on which they were not allowed to smoke or drink water for the entire 25-mile walk. They were also taken out in the heat of the sun and permitted to drink only twice during the same distance. These experiences not only developed self-discipline but considerably increased the confidence of the men in their own ability to go without water for long periods of time.

*See "Are Our Machine Gunners Really Experts?" on page 70.

Two jeeps and a truck of Captain Smith's party break camp the night before the Bengasi raid. Each jeep mounts four .30 caliber machine guns in pairs, which can be shot either simultaneously or individually. Note the two sets on jeep in foreground.



Terrain such as this was encountered near Bengasi. In the center of the picture between rock mounds can be seen what is known as a "Wadi," often used for a roadway.

Supplies for guerilla units naturally can be brought in by air, and food can often be taken from the enemy or picked up from the civil population. In Libya, each man was rationed an average of one quart of water a day per man in addition to two cups of coffee or tea.

Trained Guerillas for Europe

In the desert, the guerillas followed no roads, but travelled solely across country, and the work was naturally an entirely different type of operation from that which would be required in terrain such as continental Europe. It does not matter, however, where trained guerilla operations are used; difficulties of one kind or another are always encountered behind any enemy lines—but the results outweigh the handicaps. In the desert it was easier to maneuver; in Europe, it would be easier to camouflage. In the desert, guerilla activities were handicapped to a certain extent by difficulties of transportation. On the other hand, in the occupied countries of Europe, guerillas would have the benefit of forests and mountains in which to hide, and inhabited areas in which they would be able to get food and water.

It is possible to visualize a large army built up to operate in small bands as trained guerillas in Europe, and it is believed that such an army could very easily be built up by selected volunteers from the different army units.

The greatest difficulty to be encountered in guerilla warfare in Europe would be enemy tanks and armored cars rather than airplanes, but since all or most of the work would be done at night, the natural camouflage

of the country would be of great assistance in hiding out in the day time.

The demolitions carried would be that needed for the type of work expected in the particular country. For instance, in France, additional land mines would replace limpets. It would also be possible for operations in Europe to take field pieces, which could be dropped in gliders or even in parachutes.

With the use of gliders, groups of men and jeeps could be dropped continually behind the enemy lines by parachutes. Under proper leadership of the guerilla commander, these different groups could be kept in constant touch with one another by radio communications.

Ideal Organization

An ideal organizational setup for trained guerilla warfare would have three companies to a battalion in order to allow for fighting in a triangular formation when desirable. Each company would be comprised of four sections. Thus if tactical conditions warranted, the battalion could be split up into twelve self-contained sections, capable of operating as individual units. Experience has shown that the latter method of operation is the rule rather than the exception.

Desirable equipment for each section would include the following:

- Radio and radio-telephone (at least one per section)
- Machine guns—4 to each jeep, and 6 to 12 on trucks (at least 25 percent should be .50 caliber)
- Extra drums loaded and ready to use—16 to a jeep in addition to extra ammunition.
- Grenades (4 to 7 second)
- Submachine guns
- A pistol or revolver, knife, compass, water bottles, and miscellaneous personal equipment for each man
- A large amount of demolition supplies, including limpets—a mine, magnetized on flat side to fasten against the side of a ship, with time fuse. (Two of these placed one on each side, 4 feet under the water line, will blow two holes in the ship.)

Although the fighting matériel must remain practically the same for any type of terrain, the mode of transportation necessarily will vary. At times, guerillas may be required to work without trucks or jeeps, but in such warfare dependence on transportation cannot be allowed to interfere with the execution of the mission. When trucks cannot be used, pack horses can, and often will, suffice to transport essential matériel. At other times, the men may be compelled to operate entirely on foot and haul their own guns and equipment.

An ideal organization would depend largely on the equipment available. If possible, each jeep should have two .50 caliber machine guns mounted for use as antiaircraft; also two .30 caliber machine guns. One "bazooka" or antitank gun could also be mounted on the flange up forward. This would also be available for dismounted use when necessary.

Regarding organization and equipment, it must be borne in mind that there must be two groups in every guerilla organization. One group is the fighting personnel whose sole job is to work and fight. All specialists and experts in this group are also fighters, and no administrative personnel is taken into the field. The other group, which must be kept to a minimum, is made up of nonfighting personnel whose sole work is to take care of administrative duties, supplies, etc. for the fighting groups. These men, naturally, must be fighters in the sense that they will fight just as hard to get and keep supplies coming to the men in the field as the men in the actual guerilla groups are fighting to destroy the enemy. *An efficient supply system, minus ordinary red tape, is imperative!*

Conclusion

The terrain in Libya was ideally suited for the use of jeeps and is very different from that which will be confronted in the coming theater of war. But guerilla activities behind the lines can be as successful in one terrain as another. Cavalry guerillas could operate over territory favorable to that arm. Since 1941, the Russians have developed and used large groups of trained soldiers as military guerillas, and many of their *cavalry units* have had outstanding successes in this rôle. One particular example was that of Major General Dovator who was decorated for his successful cavalry operations *behind the enemy lines* during the siege of Moscow in the winter of 1941. There are many other examples, too numerous to mention here.

In case of invasion of Europe, the benefits to be derived from a large force of guerillas, operating in small units, would be of the greatest value and assistance to an army endeavoring to open a bridgehead large enough to bring in an army.

Troops trained in guerilla warfare are not new in the annals of military history. The same principles were used successfully in the American Civil War by Mosby, and in the First World War by Lawrence of Arabia. The methods employed by soldier guerillas in Libya in 1942 were new only in that the weapons, matériel, and transportation were modernized to meet the conditions of modern war.

Guerilla warfare, on the other hand, is not ordinary warfare, nor does it substitute for any present arm or branch. It supplements the action of our combined arms by performing missions behind the lines impossible for less highly specialized groups.

Properly used, trained guerilla troops can furnish just one more means with which to disrupt the Nazi war machine and hasten its final breakdown.

Employment of Air Force

by Brigadier General H. S. Hawkins, Retired

MODERN war can be won only by a combination of land, sea, and air forces working in close co-operation.

Although air power applied to the bombing of enemy war production plants is certainly useful, this is not enough. There is still more useful employment for the air force. The effectiveness of bombing, and especially the launching of torpedoes, from aircraft in naval action has been demonstrated so convincingly that there is no need for further comment.

The coöperation of air force with armies in land warfare is imperative. Close support to ground troops operating against the enemy should be one of the most important uses of our air forces. Never again in this war should there be the absurd spectacle that obtained in France in 1940. In that campaign, French and British armies were being defeated and pursued by overwhelming German forces of all arms on the ground, closely supported by air force. And while that was going on, the British and French air forces were bombing Essen and other points in Germany far behind the battlefields. They offered no effective resistance to the German air forces, or the German armored forces that crowded and frequently jammed the roads.

The same thing can happen to this country unless it is insisted that our air force units be subordinated to the commanding generals of our armies. The Navy needs its air force, as has already been indicated. The Army likewise needs its own air force (as has recently been demonstrated) just as closely as in the case of the Navy.

This fact has not yet become apparent to the people of our country. They are still under the spell of the Douhet theory. They hail with delight the reports of the frequent bombings of German cities, which at this writing are being carried out by British and American air forces in England. They have been told that this will bring Germany to her knees. They talk about doing the same thing to Japan, and indulge in dreams that this is all that is needed to defeat Japan.

The bombing of enemy supply and production sources is undoubtedly effective, and its importance should not be minimized. Army air forces will, for an indefinite time, have this task. They probably prefer this task to that of supporting ground troops, because in the former case they operate independently, while in the latter case they must be subordinated to the will and direction of ground army chiefs. Therefore, the problem arises as to how much of our air forces shall be assigned to these independent operations, and how much to the more important operations in close coordination with the movements and efforts of the ground armies.

This problem can not be solved satisfactorily until everyone concerned has discarded the idea that air power *alone* means victory. There should be assigned to our armies the amount of air force, designated by units, that is considered necessary for the proper support of ground troops. By this support is meant, not only the participation in battle by dive bombers in attacks against enemy troops, but also reconnaissance observation, communication, bombing of supply trains, ammunition dumps and enemy headquarters, transportation of troops to tactical or strategical points, transportation of food and ammunition in special cases, and any other useful employment. Of course, much of this is being done. How much, is not known. Of all these items, however, reconnaissance and participation in battle are the most important.

Not until after all of these means of support to the Army have been provided, should independent air force operations be aimed against the production centers in an enemy country. It is not meant that these independent operations should be delayed or postponed until armies are in the field against the enemy. But it does mean that the material, class of planes and personnel which are devoted to such operations, should not militate to leave the ground forces without sufficient air support when such ground forces go into action. Furthermore, everything must be in readiness before such action begins, and much preliminary train-

European

Buried in the desert sand of North Africa, a Junker S7 dive bomber plane stands as a striking symbol of the defeat suffered by the Afrika Korps. Hundreds of Nazi planes were similarly put out of action by the British.

Harbor installations at the important Axis supply port of Sfax, Tunisia, are battered from the air by Allied bombers.

ing is necessary to coördinate the action of the combined forces.

The independent operations of our air forces and the R.A.F. in England are undoubtedly useful. They are in process before any large scale American Army operations have been set in motion. But when those Army operations are started, the necessary air forces must be incorporated as a part of those armies and trained and ready to assume their various duties in the armies, just as is the artillery or any other branch.

This cannot be left to the last moment. It must all be attended to sufficiently beforehand to have a trained and well coördinated team of all arms. There must be no improvisations. Air forces equipped and trained only for independent operations will not be suitable for such assignments. They must be an organic part of the Army force to which they belong and in close liaison and association with other branches of the service.

Some air forces are already serving with troops in this manner in North Africa and the South Pacific. Because the latter case is one of island warfare, the air bases are very far away from the troops that they support. The airdrome on Guadalcanal, of course, is close to the troops on that island; but those troops are there only to defend the airbase that we wish to use for other purposes. Even there, the inability of air forces *alone* to defeat the enemy ground forces is being demonstrated in a very convincing manner.

Last spring many people, including some military personnel, were lamenting the fact that there was not enough air force in the Philippines to defend at least the island of Luzon. Enough troops with a sizable force of airplanes could have defended the island. A large force of troops even without air force might possibly have done it. Air force *without troops* could not have done it.

In the summer of 1942, in North Africa, the British with superior air force were beaten by Rommel. The whole story has never been told, but perhaps superior numbers of troops at Rommel's disposal, or tactical errors by the British and a failure to use the air force in tactical coöperation with the ground troops, was at least partially responsible.

This is a very desperate war, and the air force can perform a very great part in it, if it is properly used. If the air force is not properly used, the war will be prolonged by such misuse, and blood and treasure will be expended unnecessarily.

It is futile and stupid to assign all importance to any one branch of the fighting forces. If all are necessary, then no one branch, however small, should be disparaged. And no one branch, however large, should be considered as the one branch that will win the war. Morale is a delicate thing. Every one man in the fighting forces should be given as much credit and importance as any other one man, no matter in which branch of the service he serves. Otherwise, jealousies spring up and disrupt judgment, initiative, efficiency, coöperation, and unity of effort against the common enemy. Generosity toward each other should pervade all branches, and when one element has performed a service that attracts the public attention, all other elements should subscribe generously to the general praise.

When our chiefs or leaders, military or civilian, press writers or radio commentators, or any other persons whose speech or writing is given publicity, make statements that this or that arm or branch is *the one* that has won a victory or *the one* that will win victory, he has done a disservice to the whole fighting force and to the whole country.

American B-25 bombers fly low over their camp after taking off on a mission somewhere in North Africa. Bombers like these "softened up" Rommel's Mareth Line and played a large part in forcing the Afrika Korps' retreat in Tunisia.

Air Power Gets Full War Test*

by Frank L. Kluckhohn

ALLIED HEADQUARTERS IN NORTH AFRICA, April 10—In the African war theater this week has not only seen a terrific air "blitz," but has provided a preview of things to come when United Nations forces invade the continent.

No one will deny the great part that aviation has played in this theater. It has been proved again in the heavy fighting in Tunisia that with planes an army can move forward, and without them it can be stalled and even forced to move back. At the Mareth Line, and this week again, planes played an important part in the move forward; just as earlier at Kasserine Pass, the absence of them, first, had a great deal to do with the German advance and, later, their presence was a factor in the German retreat.

Planes Alone Not Enough

Yet in North Africa again it has been demonstrated that, whatever their future possibilities, *planes alone cannot decide an issue*. They are super-mobile artillery of advancing or retreating infantry—as destructive a force as naval ships. They fly fast when there is no opposition in the air. In fact, they may play almost a lone part on the sea (although not in ground warfare) and are essential when the enemy has planes in the air. Armies can no more advance without planes than they can without heavy artillery, and the lack of both when the enemy is in possession is catastrophic.

Here this week, we have seen air power used at its best under Air Marshal Sir Arthur Tedder, who has had desert experience. Major General James E. Doolittle's strategic air force has bombed, set afire, or destroyed about sixty Axis ships at this writing. Other planes have pounded Axis air fields from Sardinia and Sicily to southern Tunisia, and destroyed many planes on the ground. Still other planes have attacked enemy armor, soldiers and ground assembly columns, and thus helped to hamper action.

This represents almost the perfect use of air power. No one who has watched it at work can deny its effect on morale or its destructiveness. Similarly, no one who has seen aviation in action from underneath can fail to realize its limited effect at this stage of its development.

The writer has seen Axis aircraft score direct hits on a rail station and seen the line repaired within eight hours—and this before we had equality, let alone the present overwhelming superiority, in Tunisia. He has seen troops rally after three straight days of bombing and seen convoys move with the loss of relatively few vessels, despite aerial activity.

Facts on Air Control

This weekend, after three days of "blitz," air force communiqués speak of knocking down Stukas (supposedly obsolete planes) from the air after the huge destruction wrought from above.

The truth is that there is no absolute control of the air when your enemy has airplanes. Correspondents, including those of *The New York Times*, have reported both from the Eighth Army front and from farther west and north in Tunisia that enemy aircraft have been active.

What has finally occurred is that in this theater, American, British and some French planes have acquired tremendous superiority. Since we may expect to have that in Europe as well as here, it is important to analyze what this means.

Much discussion about air power has come from German demonstrations in Poland and France and American demonstrations in the Pacific theater. Except second hand, this correspondent knows nothing about these, but he does know what has occurred in this theater, which provides a preview of Europe. Only incidentally has he directly followed the air war from Britain, where ground forces are not involved.

What Aviation Does

What his observation, which is common to reporters on the ground, amounts to is this: Aviation, or the absence of it, can slow the enemy, hamper him and increase the tempo of retreat of forces on the ground by attacking supplies behind the lines and lessening (although not eliminating) their flow. It can aid ground forces by knocking out artillery emplacements to some extent, although not completely. It can aid in demoralizing the enemy.

But accurate correspondents with the Eighth Army (not those at headquarters) in writing air reports, speak of artillery, infantry and tank divisions, not aviation, except when it is against them.

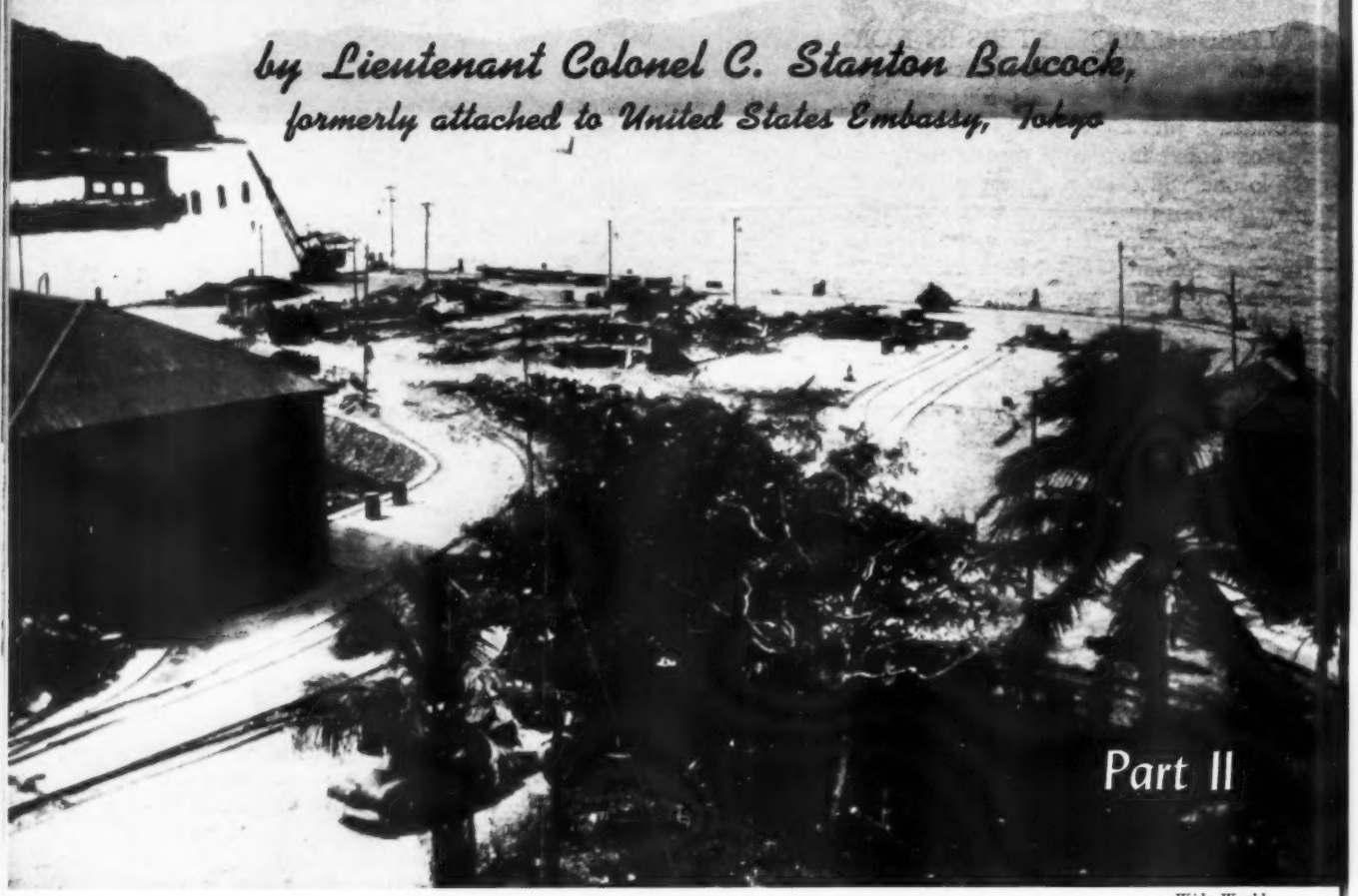
In the European landings, our great air superiority, when concentrated, can assure over a limited area that there shall be too few enemy planes in the air to affect the issue and that the ground forces will have less artillery and be more demoralized than otherwise by a great margin. It cannot clear the way completely for a landing. Obviously, that will take ground and airborne forces.

What Air Marshal Tedder achieved is the breakdown of the rapidly growing theory that air power is all. He has used air power in its proper perspective to hit the sea lanes, landing fields of the enemy air force, and ground installations with a proper distribution of heavy and medium bombing aircraft, plus fighter aircraft and those tied directly to ground operations. As in Tunisia, that should prove a big help when we go into Europe.

**New York Times* (by wireless).

Philippine Campaign

by Lieutenant Colonel C. Stanton Babcock,
formerly attached to United States Embassy, Tokyo



Wide World.

Mount Mariveles on Bataan Peninsula as seen from Corregidor.

The Attack on Bataan: January

After the occupation of Manila, which occurred without incident, the Japanese spent ten days in assembling, reorganizing, and equipping their troops, reconnoitering the American positions from the air, and carrying out raids on the defensive lines in order to determine their strength.

They found that the lines, stretching across the base of the peninsula from Manila Bay to Subic Bay, were very strong and formed a position from which the Americans could take advantage of the thick jungle and rough terrain. They also provided ideal observation from Bataan Peak and its surrounding hills.

There were only two or three places on the Manila Bay side, and only Olongapo on the western coast, where landings were feasible. The position of the great island fortress of Corregidor, three miles off the tip of the peninsula and squarely in the middle of the entrance to Manila Bay, added greatly to the defensive strength of the American positions. Mariveles, located at the head of the small bay of the same name at the end of the peninsula, and Subic and Olongapo on Subic Bay, were minor naval bases, but their facilities had been destroyed when the Asiatic Fleet left for Surabaya shortly after the first Japanese landings.

During the defense of Bataan, Mariveles was used for communication with Corregidor; the other small ports were not used at all by the Americans. Actually, both Subic and Olongapo were captured early in February.

Apparently carried away by their early successes, the Japanese made the first ill-considered move of the entire campaign when they launched a hasty and poorly prepared attack along the entire 30-kilometer front on January 12th. At no point did their troops succeed in piercing even the first line of defense. The counterattack, executed by two divisions of the Philippine Army, drove the Japanese two miles in rear of their original positions and cut the Lubao-Olongapo road which was their principal lateral axis of communications.

This setback made the Japanese much more cautious,

Lieutenant Colonel C. Stanton Babcock has recently been promoted in rank to colonel.

and their next offensive, which was designed to recover the road and their former positions, was carefully planned and well executed after four days of thorough preparation by air and artillery bombardment. The battle lasted three days and was by far the most bitterly contested struggle of the campaign up to that time. The initial Japanese push reached its objective within some five hours of the jump-off, but their advance units were subjected to such intense artillery fire for the rest of the day and throughout the night, that they were never able to consolidate their positions.

Early the next morning, realizing the precariousness of their position, and being aware of an impending American counterattack, the Japanese withdrew their most advanced troops and gave up about half of the ground they had gained the previous day. The move was a good one, for the counterattack launched a few hours later was designed to drive the invaders out of their most advanced positions and, of course, landed in mid-air as a result of the Japanese retreat. When contact was gained, the force of the American drive was largely spent, and the Japanese troops instead of being disorganized by having been driven back from their positions were ready for the attack and stopped it easily.

Later in the day, the Japanese resumed the offensive and succeeded in reaching all their objectives for the second time. This time, heavy counterbattery fire by their artillery neutralized somewhat the effect of the American fire, and they were able to hold their positions until the next morning, when a strong counterattack drove them out once more. Now, however, it was the Americans who were unable to hold their gains, for their drive had carried them to the foot of the mountain range across the Olongapo-Lubao road, and their positions in the lowland were obviously untenable for very long. MacArthur either had to push on, which meant a general offensive, or withdraw to his lines across the base of the peninsula. There was only one choice, so during the night he pulled his divisions back to their original positions and was probably well satisfied with the time that he had gained and the really heavy losses which the Japanese had suffered—the first real losses, in fact, which they had incurred in the entire campaign.

The Attack on Bataan: February

It was now obvious to the Japanese that the reduction of Bataan and Corregidor was an operation which would require a major effort and all of the troops that they could assemble for the purpose. Lieutenant General Homma, the supreme commander in the Philippines, called a halt to operations in other parts of the islands and concentrated all of the troops that he could spare in preparation for a serious attack on the American lines.

Early in February the entire front, which had been quiescent for more than two weeks, broke out once more

Author's Note

This account of land operations in the Philippine Campaign is based on information drawn entirely from Japanese sources: official bulletins, news reports, speeches, radio commentaries, magazine articles, and personal experience accounts written by officers and men at the front. The only Allied bulletins used were those quoted in the Japanese press.

Japanese accounts are nearly always vague, and in some cases conflicting, for the ideas of different agencies of the Government are frequently at variance in regard to the impression they desire to make on the public. Thus, the military would sanction the publication of a personal experience story which admitted temporary reverses and heavy losses, in order to play up the courage and fighting spirit of the Japanese soldier, while the bulletins issued by the Bureau of Information were inclined to minimize all enemy efforts, in an attempt to make the white man appear as an incompetent and a coward.

The information available, virtually all of which was published only in the vernacular, has been sketchy and disconnected, issued piecemeal over a period of six months, so that its translation and organization into a coherent story has presented many difficulties.

While confined to the compound of the American Embassy in Tokyo from the outbreak of war until June 17, 1942, I was cut off from any outside news. Consequently, the preparation of this paper has not been influenced by information received through any but Japanese sources. Every effort has been made to present the material without injecting either my own opinion or that of any one else, except insofar as was necessary to choose between conflicting versions of the same action.

Allied reports of the various events will undoubtedly disclose many discrepancies. It is believed, too, that the Japanese occasionally deliberately falsified dates in order to cover up reverses or to create an impression of greater speed or continuity in their campaigns than was actually the case.

It should also be remembered that all dates are one day advanced over those used in the United States. It is, therefore, the 8th of every month that the Japanese celebrate as *Imperial Rescript Day*, to commemorate December 8, 1941, when the Empire precipitated the war which they believe will liberate the races of Greater East Asia.

The Invasion of the Philippines from the Japanese point of view.

with renewed activity. The Japanese opened the show by staging a series of raids at both ends of the lines. The first few raids were small and short and designed to secure information and identifications, but they soon increased in intensity and scope until the 10th of February when two strong attacks, obviously intended to soften up the defensive strong points, were made by units the size of a regiment with strong artillery and even tank support.

All of this, of course, brought out an answering series of raids and patrols from the American side, and scarcely a night went by without a number of fierce minor engagements taking place at various important points along the front. The American raids and counterraids were for the purpose of finding out what was going on behind the Japanese lines, where they were concentrating, and where and when the main assault would come. The patrol activity by the young officers sent out through the dark enemy-infested jungles, and the intelligence work of the Headquarters staff appear to have been well done, for the Japanese admit that the defenders were well prepared and well informed when their two simultaneous attacks at Olongapo and Samai finally took place.

The infantry assaults, which came at dawn, were preceded by an eight-hour artillery preparation, with particularly heavy concentrations on the American batteries, and a thick blanket of smoke laid on the northern slopes of the Mt. Bataan range to blind the observation posts. The drive south along the east coast road smashed well into the main line of resistance and created a long narrow salient in the right wing of the American line. All day, the Japanese struggled to widen the gap and poured fresh troops into the line at the western base of the salient, but without effect. When the well-timed American counterattack came, just as the last effort of the Japanese was petering out, they were swept back to their jump-off positions and thrown completely out of the salient they had fought so hard to create.

During the next two days, the Philippine division in this sector acted so aggressively and launched so many local attacks that the Japanese were never able to gather themselves sufficiently to resume the offensive. They remained active, however, and, in spite of their failure to gain ground, managed to keep the Americans in their front thoroughly occupied, and probably prevented additional reserves from being sent to the Olongapo sector where the defenders were experiencing considerable difficulty.

The Japanese assert that the attack in the Subic Bay area against the Olongapo base was the main effort of this February offensive. Certainly they employed a strong force there (apparently two divisions) and drove their attacks home in a most determined manner. Not one of their assaults was stopped until its objective was reached, and none of the American counterattacks succeeded in regaining any lost ground.

For the first time in this campaign, the Japanese had recourse to their famous *Hōi Jōriku Sakusen,* or enveloping movement, by landing behind the enemy's lines. This operation had been used time and again to good effect during the campaigns in the lake region of Central China, and four years of practice had made the troops particularly skilful in this, a favorite Japanese maneuver.

Embarking somewhere in the vicinity of Subic, a specially trained landing detachment made its way up the bay during the night, and shortly before dawn attempted to land one or two kilometers south of Olongapo and behind the American lines. They succeeded in gaining a foothold on the beach, which they maintained for about two hours, but they were never able to widen the beach-head or to exploit their initial success and finally, according to the Japanese account, "were wiped out to the last man." It is more likely, however, that a good many of the prisoners captured by the defenders of the Bataan peninsula came from this unit.

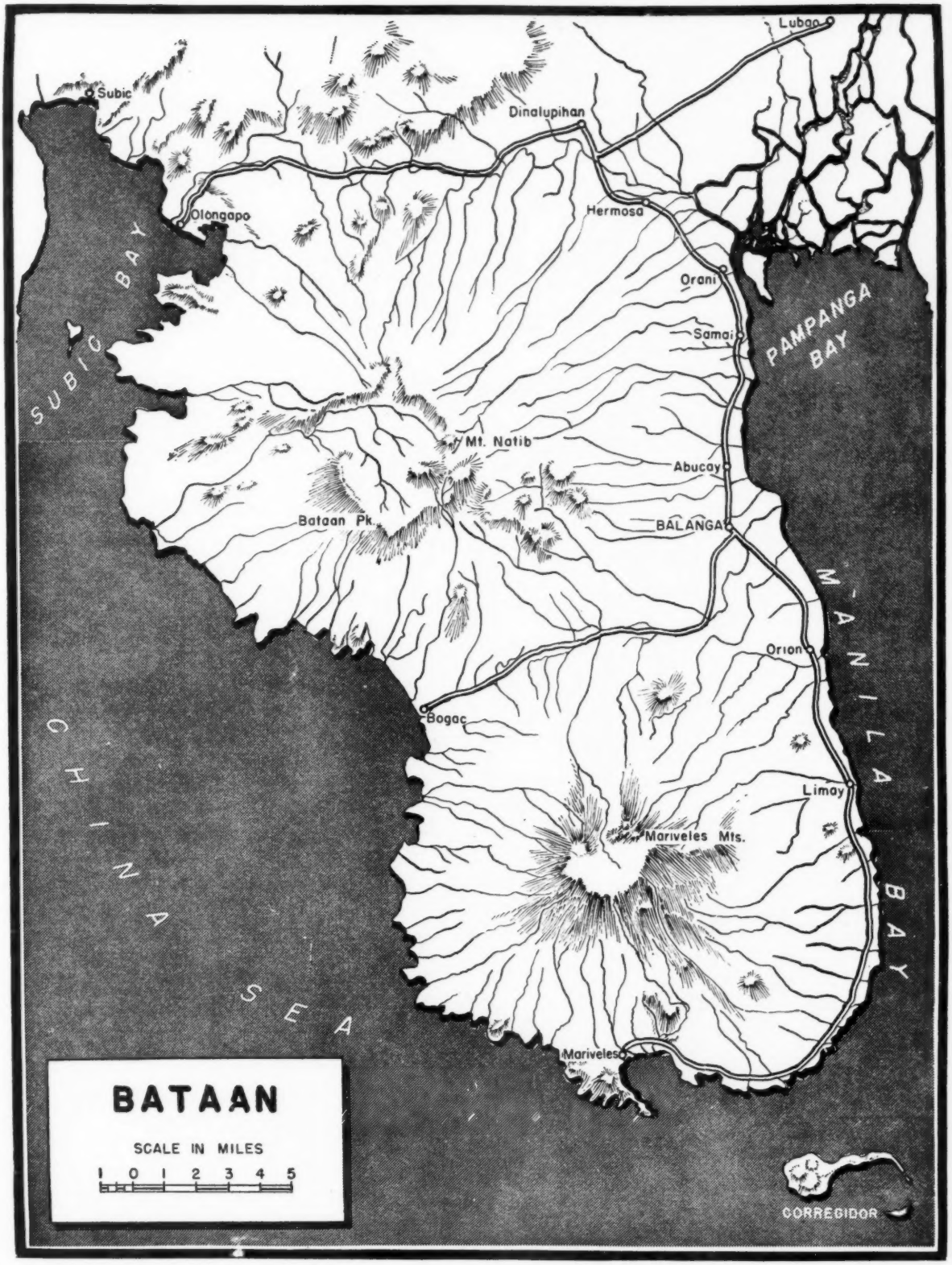
Although this attack in itself was a failure, it contributed greatly to the fall of Olongapo by disorganizing the rear areas behind the front line troops (who were engaged in resisting the main Japanese attack), creating confusion, and causing the diversion of support and reserve units that might have been used in badly needed counterattacks. On the other hand, the complete elimination by the Americans of this landing unit saved large numbers of their own troops which would otherwise have been cut off by this detachment and caught between it and the main Japanese force pushing south on Olongapo.

Apparently no serious effort was made by the Americans to retake Olongapo. They seem to have made a thorough job of destroying such naval facilities as remained there and fought desperately in defense of the place for the greater part of the morning. Then, fighting all the way, they evidently withdrew gradually until, at a point about two kilometers south of the town, the withdrawal became a hasty retreat accompanied by considerable confusion. Darkness saved the fleeing troops, and the Japanese halted their advance and spent the night in consolidating their positions. The fact that even when morning came they made no attempt to resume the attack, in spite of the obviously confused and weakened state of the Americans, would indicate that the attackers had selected limited objectives for this fight and probably that they had achieved them all.

The Fall of Bataan

There now ensued a long period of comparative inactivity, broken only by one serious offensive launched early in March. Practically nothing is mentioned of this drive in Japanese reports, and there are indications that it accomplished very little and was costly in both personnel and equipment.

The Japanese press at that time was full of reports testifying to the accuracy of the American artillery fire



On the rugged Bataan Peninsular, American and Philippine troops held up the Japanese campaign for nearly four months and thus gained for the United Nations some of the most valuable time of this war.

Wide World.

One of the last pictures to arrive from beleaguered Bataan shows how one community had been battered by Jap air raiders and artillery.

because of the excellent observation available from the Mt. Bataan range, and it would appear that this March drive broke down under the barrages of the defending batteries. Certain it is that for the next month, the sky over that sector was full of Japanese reconnaissance planes combing the area of thick jungle for the battery positions and paving the way for the mass bombing attacks that ushered in the final offensive on April 3rd.

In preparation for this battle, which was to close a little more than a month later with the collapse of all resistance in the islands, the Japanese moved into the Philippines an additional mechanized brigade equipped with the new medium tanks, about three heavy artillery brigades, and probably one fresh infantry division. In addition, both the army and navy air forces were reinforced by numerous bomber squadrons, released by the fall of Singapore and the collapse of resistance in the Netherlands East Indies.

All preparations were carefully made, and it was clear that this time the fight was to be carried through to a finish. Gradually the patrol activity along the front became more intense; air reconnaissance gave way to increasingly fierce aerial bombardment of the dreaded American gun positions; and the morale of the Japanese troops, heightened by all these preparations, was raised to fever pitch by the news that General MacArthur had flown from Corregidor to Australia and "deserted his command on the eve of its most decisive battle."

Lieutenant General Wainwright, who succeeded MacArthur, seems to have made a thorough estimate of the situation and to have made all dispositions possible to meet the expected attack. But, even before the assault really began, it became evident that the constant pounding from the reinforced Japanese artillery, and from the bomber squadrons that seemed to fly at will over the American gun positions, was daily reducing the effectiveness of the defenders' strongest weapon—their magnificent artillery barrages.

In order to conserve their dwindling ammunition supplies, the American batteries remained silent under this rain of fire, except for occasional interdictory fire at night on important roads, and a short but fierce concentration on the Japanese assembly areas as the troops were moving into position the evening before the attack.

The attack itself came in true *blitzkrieg* style just after dawn on April 3rd. The steady artillery fire, which had been daily increasing in intensity, rose to its maximum rate as the zero hour approached. The gunners poured a constant stream of high explosive on the defensive strong points, and placed thick black smoke on the heights where the American artillery observation posts were located. As daylight came, all the Japanese bomber planes in the Philippines roared overhead and unloaded on vital objectives, which the constant aerial reconnaissance of the previous month had carefully located—the last remaining airfield on the coast below Balanga, the defiles and bridges in the all-too-sketchy road net used for movement of the defenders' reserves and supplies, gun positions and ammunition dumps, and the assembly areas where the exhausted Americans were concentrating their scanty reserves.

Again, the points of attack were the extremities of the line. But this time, the main effort was made on the Japanese left, where they hoped to smash their way down the east coast road, cut off the defenders in the hills inland, break them up into isolated centers of resistance, and then mop up at leisure.

The first few hours of the attack were easy going for the Japanese. The heavy preparatory fire of the previous five days had forced the defenders to withdraw practically all troops from the outpost line and even, in some cases, from certain positions of the main line of resistance which had been subjected to particularly heavy fire. As the picked combat teams of infantry and engineers worked their way through the jungle, they encountered scarcely any resistance worthy of the name and found that even the defensive artillery barrages were unable to do more than slow their advance a little.

Eventually they reached the first strongly defended points and set about the business of piercing the defense zone so as to open the way for their tank battalions. Here occurred some of the fiercest fighting of the war. The struggle surged back and forth over the same ground for five days with heavy losses on both sides. The Japanese objective was to open a gap in the main line of resistance, through which they could pour their mechanized units and fan them out in the rear areas where they could disrupt communications, destroy supply and ammunition facilities, attack concentrations of reserves, and so disorganize the American sector that any orderly withdrawal of the defending troops would be impossible.

In order to prevent just such a disaster from occurring, the American defensive zone, extending south for a distance of six miles, had been organized in great depth with new centers of resistance, one behind the other. As the five-day battle raged it became evident to the Japanese that a break-through was impossible in the early stages, and they settled down to the arduous and costly task of fighting their way through the strongly fortified zone step by step with their infantry combat teams.

Day by day, they pushed forward under terrific barrages of supporting artillery, consolidated their gains, and fought desperately to beat off the American counterattacks. These had been fierce at first and frequently succeeded in driving the invaders back to their jump-off positions; but as the days wore on, and the same depleted and exhausted Americans had to battle over and over again with an endless stream of fresh Japanese troops, resistance weakened, and the Americans gave up position after position without attempting to retake them.

By the afternoon of April 8th, the Japanese attacks on the west had created a salient about three miles deep,[3] but the force of their drive had been spent, and it appeared that the Americans had little to fear in this sector except a series of containing attacks to pin them down and to prevent the movement of troops to the other flank. *On the east,* however, where the road runs down the coast to Mariveles, the defenders' situation was much more serious. Here the last of the carefully prepared defensive positions had been pierced, and nothing stood before the Japanese mechanized units, brought up at last for the final thrust, but a few hastily prepared shelter trenches and barricades thrown up by what was left of the American First Corps.[4]

The next morning the tanks jumped off and within an hour had pushed through to Orion, half way down the peninsula, and cut the east-west road which was the American main lateral axis of communication and supply. Here a part of the mechanized force turned west, and following this road, forced its way across the peninsula. By this action they completely disorganized the rear areas of the American First[5] Corps and the Philippine Corps, and bottled up those troops in a pocket from which they were never to escape. At the same time, detachments of Japanese infantry peeled off from the main column, which was following the tanks down the east coast road, and, forcing their way through the jungles, took what was left of the positions on Bataan heights in rear and flank, and then mopped up the last remaining isolated centers of resistance.

The end was now in sight. The only active body of American troops left on the peninsula was a portion of the First Corps[6] which had managed to pull out ahead of the advancing Japanese mechanized units and retreat hastily down the road towards Mariveles. Sumai, where the last American airfield was located, fell with

[3]The Americans had no artillery on the West Coast at that time.

[4]First Corps was on the West Coast; Second Corps, on the East. This was evident by an error in the Japanese report.

[5]Second Corps.

[6]Second Corps.

Japanese artillery batteries 150mm. How. M15.

Wide World.

scarcely any resistance, and the Japanese High Command, which until this time had allowed no news of the battle to leak out, published the results of their great victory and announced to a thrilled nation the imminent surrender of the entire Bataan defensive force.

The surrender came on the 10th. Some 2500 soldiers and marines managed to escape to Corregidor before the vanguard of the Japanese column entered Mariveles, and all communication with the island fortress was finally cut off. General King, the Commanding General of the Peninsula force, saw the hopelessness of the situation, and sent word to the Japanese that he was prepared to surrender all of the troops under his command.

The Japanese claim to have captured in this battle 60,000 officers and men and large quantities of supplies and equipment. But the vast majority of the men were caught in isolated groups, cut off from all support and supplies, and there does not appear to have been any mass surrender of organized bodies of troops capable of further resistance. The Japanese themselves admit that practically all of the artillery pieces taken were damaged, and they have never published any figures on the quantity of ammunition captured, so it is unlikely that any large units surrendered until most of their combat equipment had been put out of action.

This is a view of a tunnel on Corregidor Island into which American Forces were crowded by overwhelming Jap troops.

Wide World.

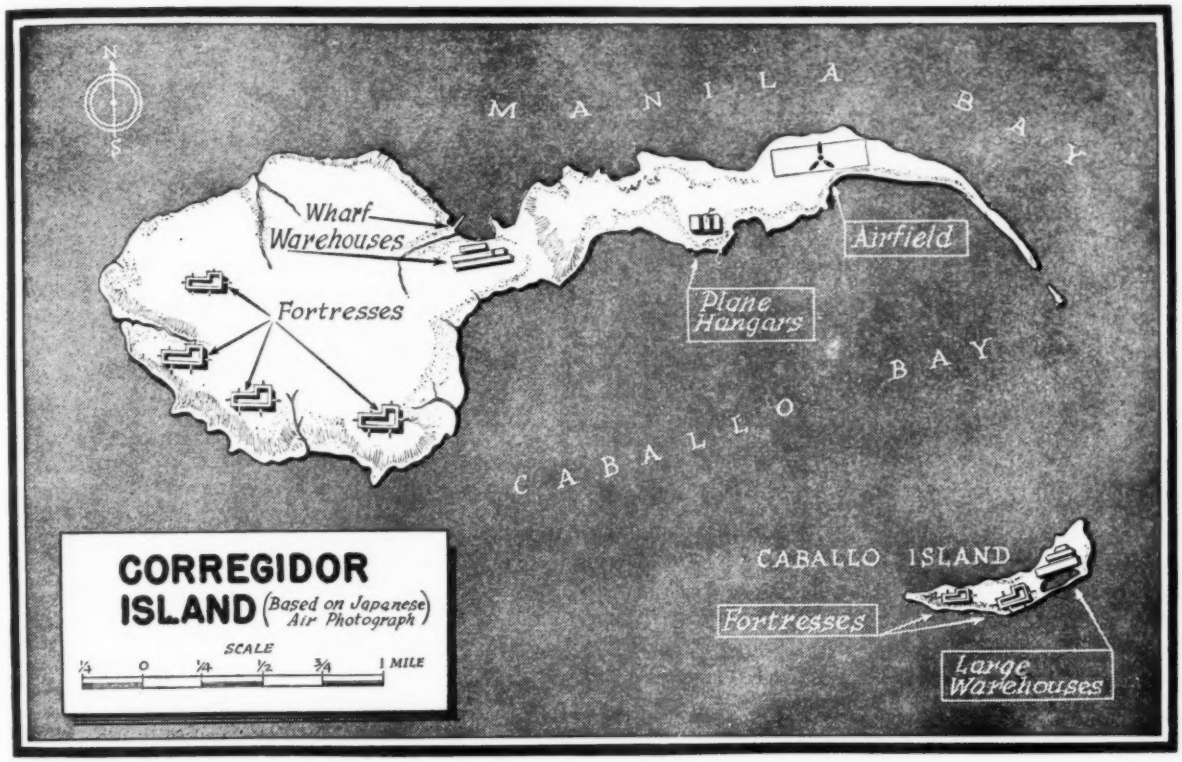
Corregidor

The attackers lost no time in pushing preparations for the assault on the last remaining stronghold, the fortress of Corregidor. Within five hours of the entrance of the first troops into Mariveles at the tip of the peninsula, the Japanese were installing their heavy guns on the slopes of Mt. Mariveles in preparation for the great artillery duel that was to last more than a month and finally come to an end with the silencing of all of Corregidor's guns and a successful attack by a landing party.

Mopping-up operations on the peninsula, and the movement of prisoners and captured matériel were delayed until all units to be used in the initial bombardment of the island were in position. No time was given the worn-out troops who had escaped to the fortress to reorganize and recuperate, and as evening fell on the day of the surrender of Bataan, the weary American prisoners, concentrated in groups throughout the peninsula, heard the opening roar of the artillery bombardment, which, in conjunction with daily aerial bombings, was to continue day and night until the final surrender on May 16th.

It was only a matter of time, and both sides knew it, for the frequent bombings and the incessant bombardment were silencing the American batteries one after another. With no air corps protection, and with all of its antiaircraft batteries out of action by the end of the first week, the fortress could only lie helpless and watch as squadrons of Japanese bombers came down to within a thousand feet and bombed the gun emplacements at will. At last, early in May, a day came when there was no answering fire from the smoke-shrouded rock. Realizing what this meant, the Japanese called on General Wainwright to surrender in order to prevent further unnecessary bloodshed. But the demand was rejected—apparently in the knowledge that the gallant resistance of this doomed fort was doing much to rebuild the morale of the American people after the successive series of smashing defeats suffered by the United Nations in the Far East.

The second night after the American refusal to surrender, the Japanese launched their attack. It was a pitch black night with no moon, and the constant roar of bursting shells effectually prevented the defenders from hearing the noise of the boats and barges as the assault units approached the island. In the van were about twenty specially constructed, steel, motor-driven assault barges, each of which contained a light or a medium tank and an accompanying combat team equipped with grenades, light automatic weapons, and light mortars. The second wave, which followed at a



distance of about two thousand meters, consisted of motor launches, tugs, ferry boats, and anything else that was capable of making the three-mile trip from Mariveles. Some of the troops and equipment, which crossed over after the initial landing but while the fighting was still going on, were transported in big barges and lighters towed by tugs.

The first wave was within five hundred meters of the island before the defenders gave any indication of being aware of what was coming. Then a single searchlight beam swept the dark waters and illuminated the first line of steel barges racing towards the low, flat tail of the islands where the small airfield had been constructed. In a few seconds, bursts of machine gun fire broke out, and later a few mortar shells dropped on the beach where the Japanese assault teams were struggling ashore, but there was no artillery barrage from the great fortress which had once bristled with guns.

The first landing was effected at 4:30 A.M., and within an hour the assault teams had taken possession of the tail of the island. But the job of getting the tanks ashore, through the debris of the shore barricades and entanglements, proved to be so difficult that the assault on the rock had to be started without tank support. Dawn was just breaking when the first infantry units jumped off from the narrow isthmus that connects the tail with the main part of the island, and began the difficult task of fighting their way up the heights to the peak. The resistance was desperate, and the battle raged all day. But the never-ending stream of reinforcements, which crossed over without hindrance in plain sight of the American positions, forced the defenders steadily back until they were crowded together on the highest point and jammed in the tunnels unable to fight. Then General Wainwright surrendered, and all serious resistance in the Philippines ended at last when he was taken prisoner along with the 6,500 officers and men who had fought so long and desperately.

The next night, under the terms of the surrender agreement, General Wainwright broadcast a message to all remaining American-Philippine troops throughout the islands directing them to cease resistance. No attention was paid to this order, and the few remaining units in Mindanao, which had been fighting the Japanese since the capture of Davao on January 4th, continued guerrilla activities until they were all finally rounded up late in May.

The only other place where American troops were left was in Cebu, and when the Japanese got around to landing at that point, the two regiments of Philippine troops retreated into the jungle where they carried on a short but sharp little campaign and finally capitulated only when their ammunition was exhausted.

The war in the Philippines was over. Japanese control was undisputed throughout the archipelago, and the military authorities, working in close coöperation with other Japanese government agencies, set about the great task of exploiting Philippine economy and fitting the Commonwealth into its niche in the Greater East Asia Co-prosperity Sphere.

Editorial Comment

Coördination

One of the most striking examples of coördination of forces is exemplified in the recent great Allied victory in Tunisia. The results achieved should not be minimized nor passed over lightly merely because the Allies had superiority in numbers. This numerical superiority was essential, for the Nazi Afrika Korps occupied strong defense positions in hills that could be held against even a superior attacking force.

The most important principle of war—surprise—was the opening blow that resulted in the fold-up of Nazi resistance. It was a brilliant piece of strategy, which "out-Rommeled" the best that the "old fox" produced in his entire African Campaign.

This strategy required the movement of a large number of troops over a long distance without letting the information get to the enemy. It required the carrying out of a clever ruse on the part of General Montgomery's Eighth Army in order to convince the Nazi forces that the main attack was coming from the south. As a matter of fact, it is reliably reported that a large force of Montgomery's troops was detached from the Eighth Army and sent north, with those from the Second Army Corps of our own Fifth Army. Captured high Nazi commanders admit that they did not know that the main attack was coming from the north until it actually developed.

That such a surprise attack could have been launched is a tribute not only to the military genius of Allied strategy, but also to the counter intelligence machinery established to prevent such information from getting into Nazi hands. In the accomplishment of the movement, perfect coördination of every officer and man was necessary. But most of all, in the final battle, the finest coöperation and coördination was shown between British, French and American armies and the various branches of the service within those armies.

Credit for the overwhelming victory cannot be given to any one group. Neither air force, armored force, artillery nor infantry alone could have achieved this complete success. Rather, the victory can be attributed mainly to the coördination of arms and armies—the coordination of British, American and French military strategy, and the coördination of air forces, ground forces, naval forces, and supply and maintenance units that kept the armies rolling. These formed a well balanced fighting force, having and using all the tools necessary to do the job at hand.

The victory in Tunisia is indeed a convincing rebuttal against the over-emphasis of any one branch in our armed forces.

Reconnaissance Training at The Cavalry School

"The Cavalry School is given the responsibility for developing the tactics, technique, and doctrine of horse and mechanized reconnaissance units. Developments in tactics and technique recommended by other agencies will be referred to The Cavalry School for review and coördination."

This is indeed an excellent improvement in the training methods formerly in operation for the teaching of our reconnaissance units. The principles of reconnaissance are fundamentally the same for horse or machine. Only slight modifications in the details of execution are necessary in order to apply these fundamentals to either one.

It is also fitting that reconnaissance tactics, technique, and doctrine should emanate from The Cavalry School, which over a period of many years has developed the background and facilities for this type of training.

Under the new program of unified instruction, many apparent flaws in the former method will be eliminated. Differences of opinion in technique and doctrine will be ironed out before being submitted to the student—and students will learn to talk the same language regardless of the reconnaissance unit to which they are assigned.

The Military Review

The CAVALRY JOURNAL extends a cordial welcome to a new monthly magazine in the field of military literature.

The Military Review, for many years published quarterly by the Command and General Staff School at Fort Leavenworth, Kansas, has recently been changed to a monthly publication. This publication is unique in the military field in that it covers every branch of the service.

Instructors at the Command and General Staff School and other well qualified military authorities are among regular contributors of main articles. The foreign field is covered by translations or digests of the most important military writings in enemy, friendly, and neutral countries.

Subscription, which is open to all, is three dollars per year, payable in advance to Book Department, Command and General Staff School, Fort Leavenworth, Kansas.

Change of Address

Occasionally subscribers have written letters stating that they have not been receiving their copies of The

CAVALRY JOURNAL and therefore wish to cancel their subscriptions. In every case it has been found that the writer really desires to keep on receiving the JOURNAL and is very complimentary on the material therein. But he has been transferred so often that he has gotten discouraged because the JOURNAL has failed to catch up with him and has finally decided to cancel.

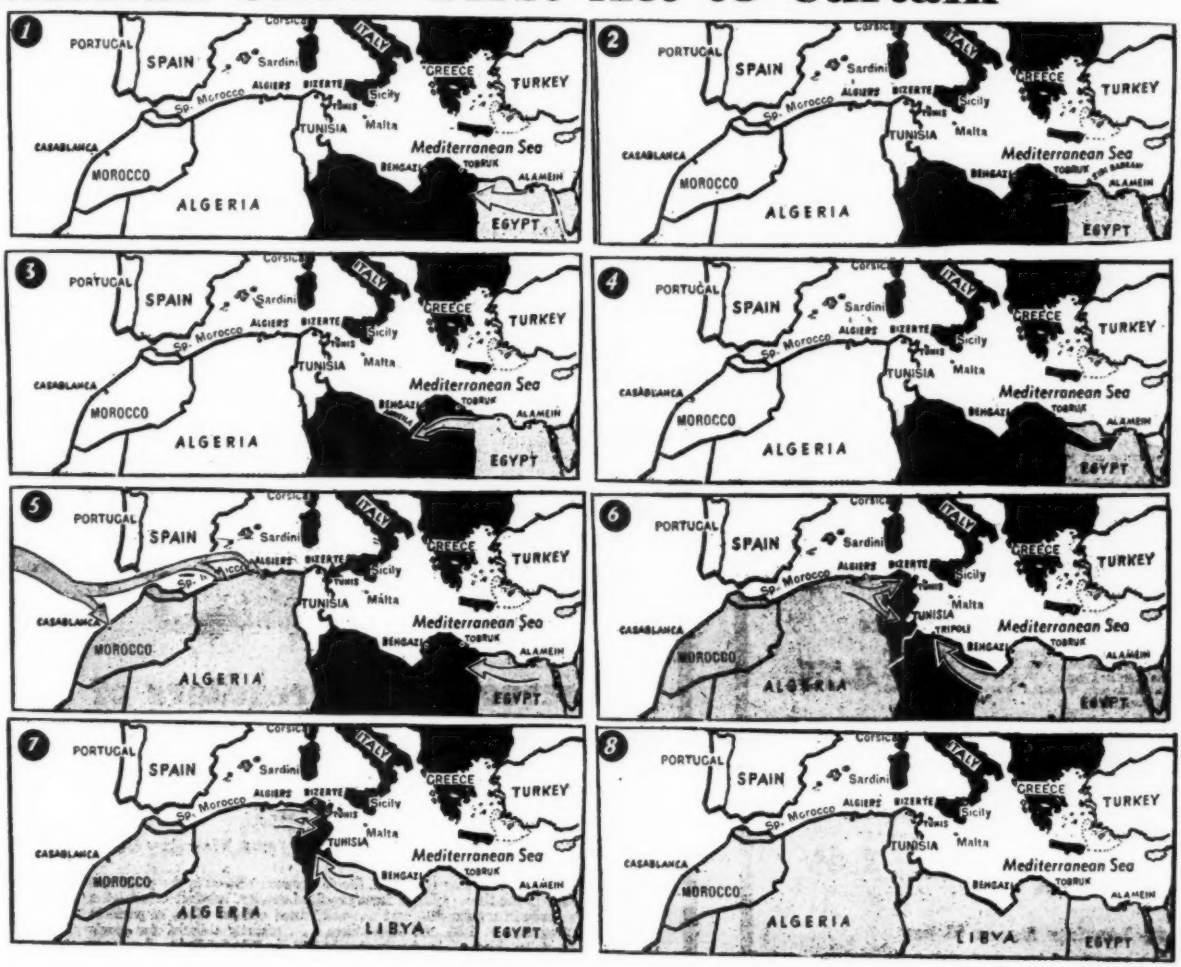
Each individual complaint is carefully checked in this office and in nearly every case, it is found that the change of address has not been received.

Sometimes the JOURNAL is returned by the Post Office for wrong address. In such cases the correct address often can be located and the magazine remailed.

We want you to receive your JOURNAL. We believe that you enjoy reading it when you do receive it. *But we must have your change of address each time that you move* if you are to receive the JOURNAL promptly. It will also help if you will drop us a line when you do not get the JOURNAL *promptly*. We will be very glad to mail a duplicate copy.

You supply us with the address. We will supply you with The CAVALRY JOURNAL.

African Show—First Act to Curtain



Washington Daily News.

(1)—JUNE, 1940: Italy entered the war, and the battle of the Mediterranean opened as British crossed the Libyan border, closed Suez to Italian shipping. (2)—DECEMBER, 1940: Italian thrust carried to Sidi Barrani, where British braced, held. British counter-attacked, see-saw battle raged in border area for months. (3)—FEBRUARY, 1941: British had hurled the Italians out of Egypt, taken Cyrenaica in eastern Libya, captured El Agheila. This was farthest British drive into Libya before present victorious surge. (4)—MAY, 1941: Rommel took command of all Axis forces in Libya, and with strong German armored force thrust to El Alamein, threatening Alexandria. British held between Alamein and Qattera depression, Montgomery took over. (5)—NOVEMBER, 1942: Allied crusher is applied on African theatre . . . U. S., British forces land in Morocco, Algeria; Rommel is chased into Libya by reinforced British Eighth Army, and Axis forces race to occupy ports, airdromes in Tunisia. (6)—JANUARY, 1943: Axis defense narrows and consolidates in southern and coastal Tunisia as Eighth Army takes Tripoli, Allied forces move up to ring of hills surrounding Tunisian defenses, come off second best in first skirmishes. (7)—MARCH, 1943: Final blow begins to fall as British Eighth Army skirts southern defense line at Mareth, U. S.-British forces start two huge drives in north and central sectors of Tunisia. Gabes falls, Axis races north. (8)—MAY 13, 1943: Last remnants of Axis forces are cleaned up in Cape Bon peninsula. Bou Ficha areas. Nazi General Jurgen von Arnim is captured. "Everything has been destroyed. We are closing down forever."

General Hawkins' Notes

A Striking Example of the Need for Cavalry

MY long-standing conviction of the usefulness of cavalry in modern war is continually reinforced and strengthened by current events in the military theaters of operations in many parts of the world. The operations of the Russian cavalry, about which not nearly enough is known, are convincing enough for any student of warfare. The effective operations of the American 26th Cavalry in the Philippines, during the winter of 1941-42, are also worthy of study.

It can also be shown how the absence of cavalry in some of the recent campaigns has had a profound effect on the fortunes of the belligerents concerned.

First of all, in 1939, the absence of a numerous force of modern cavalry in the Polish army helped to bring about the swift débacle in Poland. The Poles had about twenty-five thousand cavalry, or less. This was not nearly enough. Furthermore, it was not used properly by the high command, and it was not equipped, trained, or led to meet modern conditions. No effective antitank guns, few or no heavy machine guns, no effective artillery, no grenades, no well organized and motorized supply trains, no bold tactical conceptions for infiltrating between enemy columns, and no preparation for flank attacks against enemy mechanized columns or the columns of infantry which followed the panzer divisions. Indeed, the absence of any one of these prerequisites was enough to prevent any effective use of the Polish cavalry.

Second, the almost total absence of cavalry in the French and British armies, in the campaign of 1940, contributed much to the débacle in France. One hundred thousand French cavalry and fifty thousand British cavalry, properly armed and trained for modern war and skilfully used by the high command, could have seriously interrupted the progress of the German panzer troops and given the French and British armies time to regroup and to regain order and morale. Not only was there little or no cavalry, but throughout the whole of the Allied armies, there were neither antitank guns nor other means capable of combating tanks effectively.

Had the necessity for these means been foreseen, and had they been provided, the German army, despite its superior strength, might have been stopped far short of its total conquest over France.

Third, a powerful modern cavalry such as the Red Army's, could have done much for the Germans in their offensive against the Russians, and might have prevented the disastrous defeats suffered in the autumn and winter of 1942-43.

During the months of January and February, 1943, an American task force consisting of infantry, artillery, armored troops, engineers and other auxiliary forces, was given the obvious mission of intervening in Tunisia between the German forces of General Rommel and those of Von Arnim. Rommel's army was confronted from the east by the British Eighth Army near the Mareth line. Von Arnim's army was confronted from the west, near Bizerte and Tunis, by the British First Army. Rommel's army was expected eventually to have to retreat westward under pressure from the British Eighth Army. The American force was sent to operate towards Rommel's rear and to cut his communications and make it awkward for him in his retreat to join Von Arnim. (This statement of the American mission is only assumed as obvious. I have no official information whatever.)

This sort of mission is a very dangerous one, because the force entrusted with it is likely to be attacked by very superior forces of the enemy. If the enemy is able to break away from our force at his front he may turn upon our force at his rear with more troops than we have at our disposal at this point. It is the same kind of situation that a rear guard or delaying force has to face if the enemy attacks in force. Therefore, our force detailed for such a mission must be powerful enough to fight an independent battle with the enemy's whole force; else, it must be composed of such mobile troops that it can fight and retire if necessary without too much loss.

When such a task force is composed of armored troops and cavalry, it is very flexible. But if, instead of cavalry, motorized infantry is used, it is not very flexible. It is true that motorized infantry can move over roads with great speed to gain its initial position. If it has to fight, however, it must detruck and deploy at considerable distances away from its parked motor transportation. This motor transport must be parked fairly near to roads leading in the right direction for subsequent advance or retreat. If the enemy attacks in great force, the infantry may have to retire rapidly. It must march back to its motor transport and get loaded and started to the rear before the enemy overtakes it. But if the enemy mobile forces gain our flanks or intercept the road in our rear, our motorized forces are in great danger. The motor transport cannot readily change the line of retreat because it must use the road and cannot move across country except on very favorable ground.

Our armored forces, or tanks, would undoubtedly come to the rescue of the infantry and try to form a rear guard and a flank guard. But tanks are not suitable for fighting defensive actions on open ground, especially if they themselves are menaced by superior armored forces of the enemy.

In the situation referred to in Tunisia in February, the American force was attacked by superior German mobile forces, and found itself hampered by the very conditions just explained above. The American troops fought very gallantly but had to retreat rapidly. Many of them were unable to get back to their parked trucks in good time or to get away after entrucking, because the enemy blocked the road leading to the rear. Some battalions sacrificed themselves in order to let others withdraw. Presumably, our armored troops attacked the enemy, but many units found themselves outflanked or surrounded by superior numbers of enemy tanks.

Heroic fighting and excellent leadership no doubt saved many units and rescued much of the infantry. But, undoubtedly, many of our rear guards found themselves overrun or surrounded. Even some of our artillery, in its positions in rear of the other troops, may have been surrounded before it could get away because of the inability of our rear guards to keep in front of the enemy and delay him long enough.

Had this task force been composed of armored force together with our modern cavalry instead of motorized infantry, or perhaps in addition to motorized infantry, there is every reason to believe that the Germans could not have maneuvered so freely and so rapidly.

Cavalry in delaying actions or rear guard missions could not have been overrun and surrounded, because cavalry squadrons can move in any direction across country and do not need roads leading in the convenient direction. When fighting on foot, each small cavalry unit has its led horses placed in rear of it or not too far away for quick mounting. Motorized infantry has to be assembled at the parking place near a road before it can entruck and move in the required direction. The cavalry mounts in a much shorter time and can move in any direction either to attack or to escape.

In open order, across country, cavalry is not nearly so vulnerable to air attack as troops crowded into motor vehicles proceeding in column along roads.

For reconnaissance, other than the distant reconnaissance performed by the use of airplanes, there is no force comparable to cavalry.

For combining with infantry and armored force, as a link between these two, in attacking the enemy, cavalry is invaluable.

For security to columns of infantry or armored forces when in close proximity to the enemy, cavalry is also invaluable.

Dismounted cavalry has the same modern weapons, including antitank guns, that the infantry has. Although the infantry remains the great mobile basic arm of the service, as often stated in these Notes, it needs cavalry with it in many situations. Both armored forces and infantry need cavalry when undertaking missions in which they are liable to be attacked by superior forces of the enemy, as was the case in February, 1943, in Tunisia.

The question as to whether we ought to have cavalry in North Africa and in every other big theater of operations, or whether we could transport it overseas under present conditions, is not discussed in this paper. But there is no question whatever of its usefulness or its indispensability for certain tasks, which cannot be accomplished without it, except at the risk of disastrous losses or serious defeat.

If we ever attempt to reëstablish our cavalry and to use it in this or any other war, it should be remembered that little driblets of cavalry can accomplish very little. In Tunisia we could use, if we had it, four or five divisions of cavalry. Too often in the past, a single division of cavalry has been given tasks that required five or six times as many, with unsatisfactory results and the discrediting of cavalry as a whole, or with tragedy to the cause for which it fought and sometimes died.

This picture from Tunisia, dated April 21, 1943, shows a British mounted patrol, which assisted in locating a large amount of enemy equipment.

British official photo

German Cavalry in Russia, 1941

by Lieutenant Count de Schmettow, German Army

This short account of German cavalry protecting the flank of an armored corps is reprinted from a translation in Ejercito, Spanish military magazine, which republished it from the German Militar Wochenblatt, January, 1942.

THE first great German advances in the Russian campaigns brought the cavalry, along with an armored corps, to the interior of the country, where modern cavalry was to determine the outcome of the most difficult situations.

We moved rapidly all the way from the Bug River to the southern boundary of the Pripet Marshes. Within a week we had made long marches that had brought us close to the enemy. For the first time in this war, German cavalry advanced ahead of the motorized units, which had remained ditched in the sand of the so-called Russian roads.

On the morning of June 28, 1941 (six days after the beginning of the campaign), we prepared to carry out our mission, which was one of the most difficult that can be entrusted to mounted units. We were to protect the right flank of the units of an armored corps, which were advancing along the road toward the east and drawing steadily farther away from their bases of supply.

At 14 hours, the mounted units began their march. The motorized columns started later along other roads. Ahead of us there spread the impassable Pripet Marshes, which, in conjunction with the great forests, made an ideal zone for the enemy whose perfect knowledge of the terrain might enable him to attack the rear of our armored division.

With our General marching at the head of his squadrons, we rode over sandy and swampy ground from dusk until the late hours of the night and remained always in contact with the armored division. The mobility and flexibility provided by the capacity of our horses to travel through this area, permitted us to overcome all difficulties of the terrain and reach our objective with suitable dispositions for combat.

Horses and troops were forced to the limit of their strength. In this, the horse from East Prussia again demonstrated his excellent quality as a horse for a cavalry division. Hunger and thirst, heat and dust, mosquitoes, the weight of weapons, and dragging the combat train through sandy ground did not exhaust his resistance. *The objective was always reached within the set time, although little time might remain for rest.*

Always in contact with the armored division, we rode across the plain toward the east, and finally arrived at another river, where the infantry established a bridgehead which it continued to enlarge.

Some days later, because our communications with the rear were menaced, we started to march toward the south. For the first time in the campaign, we placed ourselves in the van of the infantry, which had advanced by a powerful drive. Moving forward with it, we constituted a wing or flank guard.

About this time, a beautiful picture was presented to our sight.

Skilfully taking advantage of the terrain, the squadrons deployed in combat formation until they reached the point where they had been ordered to dismount. Here the squadron leaders placed themselves in front, and for three days we attacked on foot against the tenacious resistance of the enemy positions in that sector. When we mounted again, some good comrades no longer accompanied us.

For a total of nine days we had marched and fought constantly, had received violent fire from the enemy artillery and had sustained repeated attacks from the Russian infantry supported by tanks.

Black Star. →

A heavy machine gun cavalry troop of the German S.S. (Armed Elite Guard). Men carry the MG 34's as well as light machine guns. Note tripods on first horse, belt boxes on far horse; also, spotted camouflage suits, typical of S.S. troops.

Meeting the Nazi Armored Fist*

by Colonel A. Yakovlev, Red Army

DURING the spring of 1943, the Donets valley has seen some of the most stubborn fighting of the war. The possession of single inhabited points or important communications is contested for weeks on end.

The Germans recently increased their resistance on this sector. They transferred large fresh forces from Western Europe to the Soviet-German front, and replenished divisions badly battered in previous fighting. This enabled them to launch furious counterattacks, which were sometimes repeated eight or ten times daily.

The present German counterattacks are vastly different from those of last winter, when the fighting took on the character of positional warfare. In those days, the Germans counterattacked unremittingly, but with limited objectives such as the recovery of former defense zones or of some favorable position. Such counterattacks were usually launched by platoons or companies and were supported by small groups of tanks.

The present situation is quite different. The Soviet troops have created gaps in the depth of German defenses and advanced many hundreds of kilometers. Mobile battles have developed over vast areas.

Powerful Combined Thrusts

The front line zigzags. Soviet vanguards on many sectors have thrust deep into the German positions, and threatened the enemy's rear and communications. The Germans take every opportunity to counterattack the attackers. They throw into battle large infantry formations, strongly supported from the air. They concentrate panzer forces on selected fronts, and frequently employ dozens of tanks to support the infantry attack.

In the Donets valley south of Kharkov, the German counterattacks developed far more than tactical significance. The Red Army had thrust deep into the enemy positions and occupied Krasnograd, Lozovaya, Pavlograd and Krasnoarmeiskoye. The Germans hurriedly transferred a number of fresh divisions to this area and launched one counterattack after another in an effort to outflank the Soviet troops and reach their communications. The Red Army offered stubborn resistance, but while the fighting was in progress, the Germans brought up more fresh reserves.

Finally, the enemy succeeded in concentrating twenty-five divisions in a comparatively small area. About half were panzer divisions. With this powerful group, the Germans tried to encircle the Soviet troops who had thrust deep into their defenses. These advanced Red Army units fought defensive battles against tremendous odds, and doggedly defended the positions they had won until, on the orders of the command, they withdrew from a number of towns, including Kharkov, and retired to the northwest.

Protecting the Flanks

The recent fighting has been a useful school of experience in dealing with enemy counterattacks. *First and foremost, reconnaissance must be carefully organized.* Whatever type of operation the unit is engaged in, wherever it may be, and whatever the situation, constant, comprehensive reconnaissance of enemy forces, positions and intentions must be carried out. The commander must always have a clear picture of the situation on his sector. He must know the enemy's intentions, and prevent his acting.

During the breaching of the enemy defenses, the flanks of the attacking force for a time remain open on

*Soviet Embassy.

Sovfoto

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Two Russian Model 1941 57mm antitank guns towed by two T-60 light tanks. The crews of the guns ride the tanks. Split-trailed, the 57s have a tube 62 calibers long (very long for any gun), and throw a 2.5kg projectile. Their range with HE is quoted by the Germans as 8km.

Sovfoto

The 57mm AT guns in action, showing muzzle brakes very like the German 50mm.

certain sectors. The enemy tries to find these weak positions in order to deliver counterblows. Reliable protection of the flanks therefore is essential.

The following example is instructive. Units of "N" formation, smashing German resistance west of Sevsk, breached the defenses and thrust forward. The Germans, suffering heavy losses, retreated, but regrouped their forces to some extent the next day. They sent an infantry regiment, supported by twenty-five tanks against the flanks of the counterattack.

The Soviet commanders took the necessary steps to protect their flanks in the area of the German concentration. The result was that when the Germans launched their attack, they were met by heavy artillery and mortar fire. The first enemy counterattack failed, but an hour later the Germans again began to advance.

One Soviet battalion then began to thrust forward into the position held by the attacking German group. The Red Army men hacked from both sides of the wedge, cut through the German tank and infantry formation, and surrounded and destroyed it. During the day, the enemy made several further attempts to counterattack, but with no success. He lost large numbers of tanks and infantry and was pushed a long way back.

The Germans had been defeated, but the Soviet commanders never forgot that they might launch an attack on the other flank. This actually happened, but as the Soviet units had reliable cover on this flank, the Germans met with no success.

Panzer Fury

During the past spring, German tanks have cooperated in most enemy counterattacks. The enemy is trying everywhere to concentrate heavy armored forces, and with these mailed fists, cut up the Soviet defenses, thrust into them, and check the Red Army's advance.

Soviet troops have learned to deal with German counterattacks. *The enemy's mailed fist must be met with powerful fire concentrations.* The Soviet troops have adequate fire power at their disposal. They have extensive antitank and other artillery. It is only a matter of utilizing fire power correctly to the full extent. Wherever this is done, enemy tanks find no thoroughfare.

A few days ago, to the west of Suja, one Red Army company, strengthened by two guns, succeeded for 24 hours in holding off a large enemy tank group which was attacking with an infantry company. The Germans advanced from various directions and tried to strike from the rear, but the Red Army men had organized their defenses so well that none of the enemy's counterattacks succeeded.

Artillery Can Hold Tanks

Antitank riflemen did particularly good work. They allowed the enemy tanks to approach within close range, and fired at them point-blank. Artillery was used where enemy pressure was strongest. The German tanks, in face of this heavy fire, either remained static on the battlefield or were forced to retreat.

When separate enemy tanks entered the Soviet defenses, the Red Army men plastered them with grenades, and the tanks were immobilized. When the Germans had lost a considerable number of tanks, they gave up their effort to break through.

When driven out of any important position, the Germans nearly always launch furious counterattacks in an attempt to regain it. That is why positions won in inhabited places and on important communications must be consolidated immediately.

For example, a unit has straddled the highway. Fire positions must be established at once, and the road covered in both directions. Antitank and antipersonnel obstacles must be erected as quickly as possible, to enable the defenders to repulse any attack, irrespective of the direction from which it comes.

In inhabited points, as a rule, defense must be circular, because the enemy frequently attempts to change his direction, to attack from the flanks, to cut the Red Army's connections with the base, or to attack suddenly from the rear.

The Germans are counterattacking on almost all sectors of the Soviet offensive. They see their counterattacks as a means of checking the Soviet offensive. Every enemy counterattack, therefore, must be repulsed.

ARMORED UNITS

In Street Fighting*

by Colonel I. Ziberov, Red Army

DURING fighting in large inhabited centers, small tank units are often obliged to act independently in separate streets. Under these conditions, it is not always possible to centralize command which makes it particularly difficult to coördinate the activities of troops as a whole when fighting in inhabited places.

Streets are usually filled with troops engaged in battle, wrecked motor vehicles, ruins of houses and remains of barricades. All this limits the movement of troops and of dispatch riders (in cars, on motorcycles, or cycles). Unless traffic regulation schemes are adopted, movement along streets becomes almost impossible. Before the attack begins, the headquarters of formations and units issue instructions on the order of movement along streets.

It is important that all troops not actually engaged in fighting should move along one side of the street and leave a passage clear for dispatch riders and ammunition trucks going forward to the companies. It is advisable to place troops, not actually in battle, in large yards or gardens along boulevards or in other places where there is vegetation. This clears the streets and at the same time affords cover for the troops.

During offensive operations in streets, tank platoon and company commanders should always be in tanks with their units and should direct their movements. Directions are given by platoon commanders mostly by flag signals, tracer bullets and shells, or orally by means of infantrymen coöperating with the tanks. Commanders of tank companies direct platoons by radio instructions transmitted through the infantry, and partially by flags. The company commander should always be able to see the leading platoon of his company, and should follow and direct its activities.

Action of Commanders

Commanders control movement of smaller units by radio, runners, and personally issued orders to units concerned. Side streets are used to move laterally along the front. Personal visits from the commander of the unit, or even of higher formations, are more frequent in street fighting than on the battlefield. The effect of this on the success of the offensive is very great. Unit and formation commanders personally, through their staffs and from observation posts, follow the course of the attack of every company in order to give them timely coöperation by all means at their disposal.

Unit command posts are situated never more than 500 to 700 meters from the firing line, and formation command posts, no more than a kilometer. Formation and unit headquarters use local means of communications, telephone, motor cars and cycles. Sometimes the telephones of infantry coöperating with the tanks may be used to direct the tank units.

In street fighting, runners on foot frequently have to be used. Considering the slowness of the advance of smaller units, these are frequently very reliable means of communication and direction.

Reconnaissance

The most important measures to be undertaken in ensuring protection are reconnaissance, air and ground observation, flank and rearguards for the attacking units, and firefighting and clearance of streets from the remains of barricades and ruins.

Reconnaissance of enemy streets, obstacles, strongholds, various buildings and objects is carried out by the leading units in the battle. Headquarters frequently has to organize special reconnaissance to establish the

Street fighting in Stalingrad. The German Mark IV tank in rear has just been knocked out.

*Courtesy, *The Tank* (British).

Sovfoto

A gun crew defends this Stalingrad street with one of the new 57mm antitank guns.

whereabouts of minefields, the character of obstacles and fortifications, strongholds, side roads, fortified objects, approaches to water supply, electric power stations, communication centers, and railway stations. Forces sufficient to ensure the necessary information are detailed for this work.

At the end of 1941 and beginning of 1942, the Germans, attempting to hold the town of Narofominsk and Mozhaisk, mined their streets so as to hold up Soviet tanks and infantry. In these places Soviet sappers with mine detectors went ahead of the tanks, found the mines, rendered them harmless, and made a passage for tanks and infantry.

Reconnaissance on the flanks of attacking units is of great importance. Its task is to discover and report signs of enemy counterattacks and enemy maneuvers on the flanks or flanking movements.

Observation

Observation plays an important rôle during street fighting in towns. Staffs of units and formations organize close observation of the enemy in front, on the flanks, and in the rear, as well as observation of operations of our own leading units. Staff observers should be in direct communication (telephone, radio, motorcycles, signal, or other means) with their staffs and should keep them constantly informed of the situation in their sectors.

The number of observation posts that can be organized depends on the situation. Brigade headquarters usually requires at least three observation posts —one in the center and two on the flanks of their area. Unit headquarters will have at least two O.P.s. One of the O.P.s organized by any headquarters should be the commander's O.P. Observers are also placed on every street.

Observation posts are placed in high buildings, in belfries, and other places from which a good view is to be obtained. O.P.s move forward together with attacking units and are never more than 400 or 500 meters from the advanced units.

The difficulties of observation during street fighting, the possibility of sudden attack from side streets, buildings, parks and other places that may serve as a cover for an enemy ambush, make it essential that special measures be taken for protecting the flanks and rear of attacking units. Sabotage and sudden attacks by enemy soldiers disguised as civilians are more likely in street fighting than in open country. To counteract this, infantry pickets are placed in streets and when occasion demands are strengthened by light tanks and armored cars.

During battle, the civil population are forbidden to appear on the streets, balconies, at windows, or street doors.

Air Protection

In the organization of antiaircraft defenses, it must be remembered that enemy aircraft will fly low to shoot up or bomb units during street fighting, as it is impossible for them to get a clear picture of the situation from high altitudes.

Air observation may be carried out by O.P.s having communication with their headquarters.

To repulse air attacks and fire on low flying aircraft, the usual weapons are employed—AA guns and machine guns, AA snipers, and groups of riflemen from an infantry unit. Tanks provided with AA weapons open fire on the enemy only when not taking direct part in battle. The best means of AA defense is for the fighter aircraft of the attacking side to cover the armored units during the attack on an inhabited point. This should be accomplished in accordance with the plan of the general staff and any request made by the staff of the armored formation.

Fire Fighting and Mopping Up

Tank units, advanced infantry, and sapper units do not take part in extinguishing burning buildings. This is the duty of reserve units of the attacking formation, or even of succeeding echelons. Operation orders should

Sovfoto

Tankists in coöperation with automatic riflemen dislodge Germans from a populated place in the Stalingrad area. The tank is a T-34—fast, medium.

provide for action to be taken by tanks and infantry who meet with fires on their way. They frequently have to go around burning districts by side streets, to return to their own general direction after passing the fires.

In the event of the fire breaking out on the leading tank, the machine withdraws from the battle line under its own power. If possible, measures to extinguish the fire are taken on the spot. This task is performed by infantry or sappers following behind the tank. Both sappers and infantry operating with tanks in inhabited centers should be trained to deal with fires in tanks, and utilize any means at hand (sand or earth).

Headquarters of units and formations organize timely mopping up operations in lanes made through the inhabited point. All houses, after having been seized, are carefully examined to ensure that no enemy officers or men have remained behind in them. As they move forward, units mopping up in buildings and streets inform following units of buildings that have not been examined. This is to prevent the possibility of them being fired on unexpectedly and to enable them to adopt any necessary measures. Particular attention is paid to clearing buildings of contact and delayed action mines.

Tank Evacuation

Street fighting usually causes greater tank losses than fighting in the field. Maneuvering tanks in streets is extremely difficult. Evacuation of damaged tanks from the battle area is a difficult task, especially in narrow streets. Damaged tanks in forward units may block the street and hinder the action of other fighting vehicles. It is not possible to evacuate tanks by means of dragon tractors until the enemy in the street has been mopped up. Tanks, therefore, are taken in tow by other tanks moving in reverse.

A tank which has been damaged in a street is covered by fire of infantry or a light tank until it is removed or repaired. Damaged tanks evacuated from narrow streets should not be taken far in tow, as this crowds the streets and hinders the forward movement of troops from the rear. Towing of a machine under enemy fire is usually done in reverse. A better method is to drag the damaged machine from the street into a large yard or park where the enemy has already been mopped up. The tank remains there until the whole unit advances; then it is evacuated to the tank recovery unit of the formation.

Because of the difficulty of observing forward platoons in action on streets, and also the maintenance of communications with them, advanced observation posts and advanced communications are combined with the observation posts set up by the staff of the unit which will most quickly obtain information concerning damage to the armored fighting vehicles in action, as this unit usually has communications with the advanced units.

A tank recovery unit of a formation operating in street battles should be situated outside the inhabited point, because frequent attacks on this unit by remnants of the enemy's forces are possible. If the inhabited point passes quickly into the hands of the attacking force and the enemy is speedily mopped up, then the tank recovery unit is set up on the outskirts of the point, in parks or on waste land. Guards for the unit are organized in the usual manner.

Ammunition and Refueling

One of the characteristics of street fighting is the unequal expenditure of ammunition in companies. The leading platoons conduct the main battle on the streets. Remaining platoons can give the leaders only partial support and mop up small enemy groups that remain behind. It follows, therefore, that ammunition is used up faster in the leading platoon than by platoons that follow. The leading platoon then halts and, when its place is taken by other platoons, retires.

Tanks should not turn in streets blocked by ammunitionless tanks. Ammunition supplies should be brought up from the rear only as far as the company headquarters.

Tanks should not be refueled in the inhabited point, especially in the streets, as this takes considerable time under conditions when the tanks, to a great extent, are without their fighting abilities.

During street fighting, refueling should be carried out only for individual tanks, and then only under conditions of absolute necessity. Groups of tanks are refueled only as an exception. Refueling should be done outside the inhabited point—in woods, on sports grounds, and other large open spaces where tanks are not likely to be attacked with bottle bombs, inflammables or flame-throwers from adjacent buildings housing enemy antitank troops.

In battles for inhabited places, the concrete situation must be considered on each occasion and decisions taken in accordance with that situation. There can be no stereotyped rules.

Sovfoto

An antitank rifle crew fire from a building in the Velikie Luki sector.

Cossacks Rout Panzers*

HOW effectively Soviet Cossack units are combating enemy tank forces was described by a colonel of Cossacks visiting Moscow. The colonel, who did not wish his name disclosed, commands a Cossack unit that took an active part in repulsing a counterattack by enemy tank forces in June, 1942.

A column of large and medium fascist tanks advanced over a broad plain against lines held by Cossack cavalry squadrons. Had the Germans succeeded in breaking through, they would have been able to penetrate deep into the Soviet positions.

The battle was to decide the fate, not only of the particular Cossack unit, but of the other Red Army units concentrated behind them. These were groomed for a thrust against heavily fortified German defenses that comprised a chain of subterranean and surface fortifications protecting the approaches to a certain city.

The battle began at dawn on a hot June day. Allowing the tank column to approach, the antitank batteries opened heavy fire. The first squall of shells disabled several enemy tanks, but the others continued to advance. Cossack antitank gunners, skilfully hidden in clumps of bushes along the roadside, then went into action. Forming a close semi-circle around the tank column, their fire slowed down another 10 tanks and then put them out of the running altogether. The Germans, however, pressed forward doggedly.

At that moment, three flights of Soviet bombers rose suddenly from behind a near-by forest and dropped their lethal loads on the attackers. In the meantime, the antitank artillery intensified its fire and forced the German machines to falter and turn back. This exposed the fascist infantry, for whom the tanks had been serving as cover. The Cossack machine guns went into action and spit death at the retreating enemy.

Having lost their tank protection, the German infantry could not stand the hurricane of fire, and soon their retreat changed to a panicky flight. They fled the field and left dozens of disabled tanks and hundreds of killed and wounded infantrymen behind them.

The Cossacks mounted and galloped in pursuit of the enemy, then engaged them in hand to hand fighting. The whole operation took nearly three hours and cost the Germans huge losses in men and equipment.

The colonel compared this battle to some he had fought in 1941. "Since then," he observed, "the technical equipment of our cavalry has improved beyond measure. The unit under my command is equipped with practically every type of the newest firearms."

One of the arms most favored by the Cossacks, the colonel said, is the antitank musket. Convenient to carry and simple to use, these weapons have been nicknamed the "20th century lance." When attached to the saddle during a march, the weapons bear a resemblance to the lances carried by Cossack horsemen of old.

Great fire power enables the Cossack units to withstand furious enemy frontal attacks even when the latter are supported by tanks and airplanes.

The colonel recalled how early this spring his unit operated for a long time far behind the enemy lines. He is quite convinced that had the cavalry not been equipped with all modern arms, it would not have been able to deal the fascists the shattering blows that played such a decisive part when the Red Army captured important strategic positions on this sector of the front.

**Moscow News.*

LAND NAVIGATION

*by Major William L. Stockman, Jr., Cavalry**

WHEREVER operations are conducted at night, in fog, or in regions where prominent terrain features are lacking, the ability to navigate is the prerequisite of success.

The present war has been characterized by large scale desert warfare and by increasing dependence on night operations. Small detachments operate independently over wide areas. To be effective, such detachments must know their positions at all times and be able to follow their chosen courses accurately. During the daytime, in terrain where prominent landmarks are present, simple map reading will suffice; but in terrain where no landmarks are present, or at night when landmarks cannot be seen, some form of land navigation will be necessary.

Types of Navigation

The object of land navigation is to keep one always informed of his position. The subject divides itself roughly into three main sub-divisions. They are: pilotage, dead reckoning, and celestial navigation.

Pilotage or point-to-point navigation is the act of moving from one well defined point, be it a natural terrain feature or work of man, to another such well defined point. This is land navigation in its simplest form.

Dead reckoning in its basic form is merely the mechanics of keeping an accurate record of deviations from a given course. Dead reckoning may be used to supplement pilotage but will ordinarily be used when pilotage becomes impossible.

Celestial navigation is more complex than pilotage or dead reckoning and consists of the procedure necessary to locate your geographical position on the earth's surface by means of celestial bodies. An octant or sextant and special tables enable the navigator to determine by means of a "fix" on a celestial body his exact location on the surface of the earth. The procedure followed is similar to that used by the aerial navigator or the navigator of a vessel. This type of navigation is resorted to only when great error is introduced into dead reckoning because of long distances involved.

Of these three-sub-divisions of land navigation, dead reckoning is the most practical method of navigation for motorized, mechanized, and armored units during darkness and over terrain where landmarks are not in evidence. This article, therefore, will consider dead reckoning more in detail than either pilotage or celestial navigation.

Dead Reckoning

As previously stated, dead reckoning in its basic form is merely the mechanics of keeping an accurate record of deviations from a given course. The equipment used

*Instructor, Department of Tactics, Staff and Faculty, The Cavalry School.

LOG No. 1

VEHICLE No. W-131729 FROM CR 829

DRIVER J. Doe DATE April 2, 1943

PASSENGERS (1) W. Jones (2) H. Smith

COURSE	TIME	ODOMETER READING	AZIMUTH	MILES	MILES RECORDED	REMARKS
1	0800	726.4	20°(m)	3.1	3	Desert trail — Cut .1mi, sand
2	0812	729.5	330°(m)	2.6	2.3	Rocky area - Cut .3 mi. detour around obstacles.
3	0832	732.1	55°(m)	2.5	2.5	Good trail
4	0858	734.6	324°(m)	.8	.8	Rendezvous!
		735.4				

Figure 1

to compute this data will vary from a dead reckoning set now in the experimental stage, to the more common equipment of government issue that is found in field units.

Some of the more unusual items of equipment to be found in the dead reckoning set are listed below with brief explanations.

Magnetic Compass, Fixed.—A fixed vehicular compass made with adjustable magnets placed close to the compass in such a manner as to neutralize the magnetic fields of the vehicle.

Sun Compass, Universal.—An instrument by which, given the latitude and local sun time, the true azimuth of any given course may be determined.

Board, Drawing, with Universal Drafting Arm.—A drawing board with a built-in protractor and drafting arm, enabling the user to plot angles automatically.

The more common items of equipment which may be used to compute the necessary data for dead reckoning are the lensatic compass, engineers scale, protractor, triangle, paper, and pencil.

The distance traveled is obtained from the odometer, that part of the vehicular speedometer that registers in miles and tenths of a mile the distance covered by the vehicle. Before starting out on a "run," the accuracy of the instrument should be determined. Many factors, however, will affect the accuracy of the reading other than the mechanical deficiency of the instrument itself. Well-worn tires and tires smaller or larger than those specified, or operated at less than specified air pressure, will cause corresponding errors in the reading on the odometer.

It must be remembered that a map measurement gives the horizontal distance between two points. In actual travel between these two points, there will be a vertical deviation from the horizontal measurement due to obstacles and hilly terrain. In sandy or muddy terrain, slippage of the wheels will cause the odometer to read more than the distance actually covered. Errors caused by any of these factors must be estimated and an adjustment made for them in recording mileage in the log. (See Figure 1.)

Direction is determined by azimuth as shown on any compass. If the lensatic compass is used, the person using it must dismount from the vehicle before taking a reading. Suggested minimum distances are 50 yards from any armored vehicle and 25 yards from any other vehicle. The lensatic compass is also easily affected by any base metals on the person.

In order to record azimuths and distances traveled, an accurate log must be kept. All information pertaining to the movement of the vehicle must be written down promptly. Nothing must be left to memory. Each major change of direction is a new azimuth COURSE. Courses are numbered consecutively in Column 1.

The columns headed Time and Odometer Reading

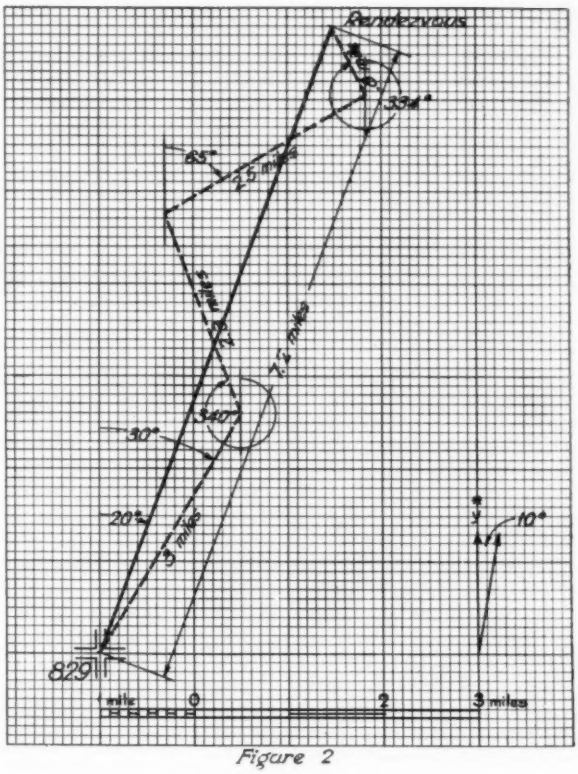


Figure 2

are filled in for each change of direction. The azimuth, either magnetic or true, is recorded for each change of direction in the column headed Azimuth. In the column headed Miles, the mileage as registered by the odometer is recorded. Under the heading Miles Recorded, the adjusted mileage, taking account of slippage, deviations, and other factors, is recorded. In the Remarks column, brief remarks about the terrain and reasons for adjusting mileage in the Miles Recorded column are entered.

A given "run" may be plotted either on a piece of graph paper or on a map. Each "run" is plotted as soon as practicable from the data shown in the log as illustrated in Figure 2.

In the following illustrative problem, a short distance has been used merely to illustrate the mechanics of keeping the log and plotting the course. Distances will usually be far greater than shown in the problem. In the problem, the lensatic compass, the vehicle odometer, a protractor, an engineer's scale, an ordinary piece of graph paper, and a pencil are the only necessary materials. It has been assumed that the magnetic declination for this problem is 10° east. All azimuth readings in the log are magnetic, and it is therefore necessary to convert them to grid azimuth before plotting them.

Problem

Assume that you have been given the mission of driving across country from CR 829 to a rendezvous pinpointed on a map but otherwise unknown. Be-

cause of the scarcity of maps or the fact that no terrain features are shown on the map, you decide to plot your course on a piece of graph paper. You must never assume that you will be able to keep a straight course all of the way unless you have certain knowledge of that fact by familiarity with the terrain.

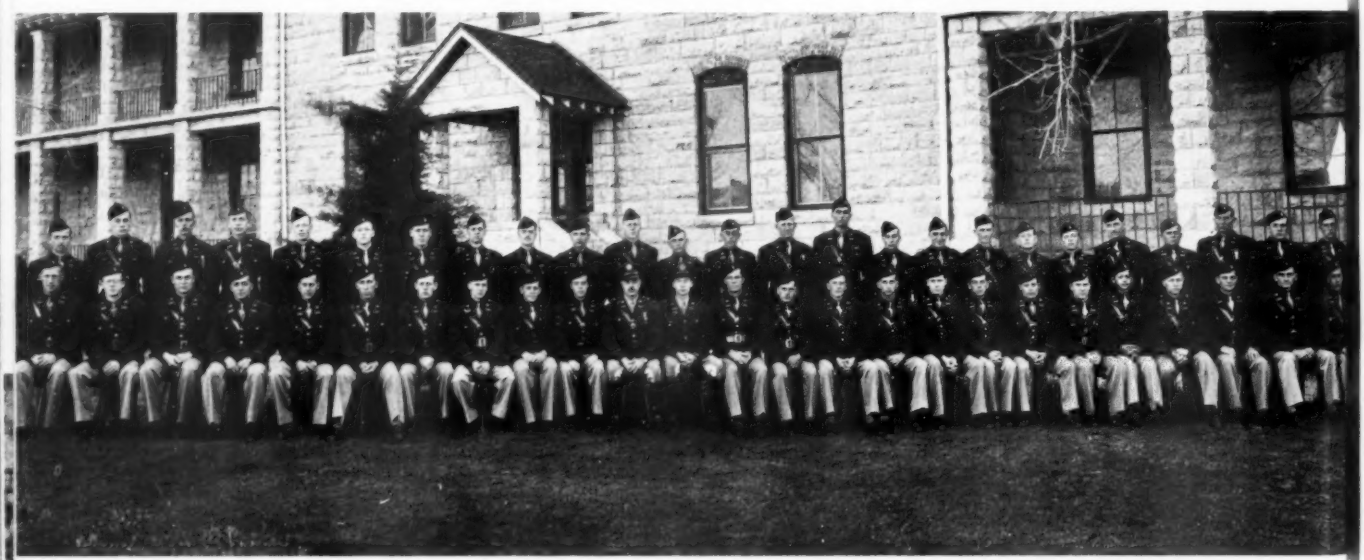
The vehicle odometer has been checked and found to be accurate, and no compensation for error will be necessary. The distance and azimuth to the rendezvous are taken from the map and plotted to scale on the graph. The distance is found to be 7.2 miles, and the azimuth is found to be 20° grid. This is your base line. If you could travel for 7.2 miles on a grid azimuth of 20°, you would arrive at your destination. Your best procedure is to travel as nearly as possible along this base line, and, meanwhile, keep track of all deviations from it.

The course, time, and odometer reading (726.4) are logged by the recorder. In approximately the same direction that you wish to advance, there is a trail which you decide to take. The azimuth of the trail is 20° magnetic. You travel an actual distance of 3.1 miles, and then you are confronted with a rock-strewn area, that necessitates a change of direction. Because you have crossed a sandy stretch, and your tires slipped, you decide to compensate for this slippage by deducting .1 mile, making the distance recorded 3 miles. These entries are recorded in the appropriate column.

Course, time, and odometer reading are entered in the log for course No. 2. You decide to go around the rock-strewn area, and you feel that an opening through the area on a magnetic azimuth of 330° will be passable. After proceeding an actual distance of 2.6 miles, you decide to get back in the direction of your original line. Because you were forced to detour around certain obstacles on this leg, you compensate for this by deducting .3 mile. Notations are made in the log under appropriate headings.

After you have entered the course, time, and odometer reading in your log, you decide to take a trail to the right on a magnetic azimuth of 55°. After proceeding up the trail for 2.5 miles, you decide to do some checking and find that you must be in the vicinity of the rendezvous as you have traveled a recorded distance of 8.6 miles. You plot your course as shown in Figure 2 and find that your rendezvous is .8 miles away on a grid azimuth of 334°. This reading is converted to magnetic, and you proceed to your rendezvous.

Successful dead reckoning depends on accurate and timely entries in the log, accurate plotting of the course, and careful estimation of and adjustment for errors in mileage.



GRADUATES OF THE OFFICER CANDIDATE CLASS, APRIL 15, 1943, THE CAVALRY SCHOOL

Reading from left to right front row seated: **Raymond E. Anderson, Willis B. Berblinger, Harold B. Beverly, Roy J. Bolen, George F. Brosan, Jr., Ralph A. Broussard, Louis F. Brown, Robert M. Brown, Thomas J. Burch, Class Secretary and Treasurer; Charles F. Carroll, Captain Harry Coopland, Jr., Cavalry, Commanding; First Lieutenant James J. Costigan, Cavalry, Executive; Albert D. Clanton, Wayne A. Cowan, Clifford W. Crites, Ellsworth C. Cross, Leo M. Doran, Robert E. Ellis, Weldon W. Fetters, Walter N. Garms, Paul R. Herrera, Paul H. Hofeditz, Class President; Victor R. Holt, Robert A. Huffman, Leon A. Isreal.** ***Back row standing:*** **George F. Lastrapes, II, Max D. Lewis, William H. Lynn, Walton J. McHale, Charles H. Mills, William J. Miniham, William R. Moran, Calvin L. Morgenthaler, Warren J. Morrow, Paul R. Moynahan, Joseph J. Olah, John B. Parkhurst, Joseph H. Peake, Dallas R. Peters, John D. Petropulos, Marx Rosenzweig, Michael R. Ryan, Martin W. Schoepfer, David H. Shenk, Edgar E. Sheppard, Donalan J. Shillington, Joe E. Shoemaker, Marvin E. Tomlinson, Furman H. Updike, Raymond E. Wantz, Harvey E. Wood, Frank L. Young.**

The Reconnaissance Squadron in the Motorized Division

*by Lieutenant Colonel Brainard S. Cook, Cavalry**

RECONNAISSANCE, as defined by the Field Service Manual, is the operation of obtaining military information in the field by troops sent out for that purpose. The term "military information" is used instead of the "enemy information," as used in some publications of the Field Service Manual, because it is believed that the all-inclusive term is especially applicable to the motorized division.

The nature of the terrain, the availability and condition of the road net, and the location, strength, and condition of the various stream crossings in the theater of operations should be items of immediate concern to any commander of motorized forces. Second only to direct information of the location, strength, and disposition of the enemy main body, these considerations will have a tremendous bearing on the decision of the motorized division commander. Hence, these terrain conditions must be a matter of immediate concern to all ground reconnaissance agencies of the division.

The mission of the reconnaissance squadron is twofold: first, to secure information regarding location, strength, disposition, or movement of any enemy forces that could interfere with the mission of the division; second, to secure and send back vital information regarding the nature of the terrain and the condition of the road net within the zones reconnoitered.

Means of Reconnaissance

Having diagnosed the trouble, the good mechanic reaches for the proper tool for repairs. Certain tools are available within the division for the accomplishment of its reconnaissance missions. Each regimental combat team has available its own reconnaissance platoon, but these are for close-in reconnaissance, and should remain under control of the combat team's commander.

The division engineer battalion also has a reconnaissance company, which includes one complete reconnaissance platoon. These men are specialists on route and bridge reconnaissance, but are not sufficient to cover all routes that might be used. They should be left under the control of the engineer commander.

The reconnaissance squadron then is the unit within the division upon which the commander must rely for the bulk of his early information. It is his own tool box, always available on his call, without depleting the strength of other units of the division.

Within this so-called tool box are the types of tools designed to accomplish the job that the squadron will be called upon to do. It contains reconnaissance units to seek out information, and support units to furnish the squadron with a fast-moving mobile reserve that can be used to conduct a reconnaissance in force or that can be held in reserve to effect a penetration of the enemy's reconnaissance screen. It may also be used to counterattack and afford the scattered reconnaissance units an opportunity to reorganize after a determined enemy attack. It also includes mortar and pioneer and demolition squads.

Scope of Employment

On many occasions, officers have suggested and problems have been written, to force the reconnaissance platoon into dismounted action, and to continue a fire fight against opposing infantry. While dismounted action is the basis upon which all thorough reconnaissance is built, and the reconnaissance personnel should be trained thoroughly in all phases of dismounted scouting and patrolling, it is not believed that dismounted action on the part of a reconnaissance platoon should be resorted to on every occasion of meeting resistance. Every tendency to close with the enemy should be avoided. Dismounted, the platoon becomes two small reconnaissance patrols, each supported by a light machine gun. Vehicles left immobile are useless and reduce the reconnaissance platoon to the same speed as the opposing dismounted platoon.

The dismounted platoon does not possess sufficient fire power for conducting a dismounted fire-fight. However, a small dismounted reconnaissance patrol may be formed from either section. This dismounted patrol should consist of not over five riflemen. These make excellent reconnaissance patrols and still leave the automatic weapons in the vehicles available for support or rear protection. Drivers and radio operators can man these weapons without neglecting their primary duties.

The most frequent questions encountered when attempting an explanation of vehicular reconnaissance are:

What frontage can be covered?
At what speed can it be covered?
How far should they operate in front of the division?

A reconnaissance platoon can cover effectively a front of from five to seven miles. A troop on reconnaissance should be able to cover roughly a frontage of from fifteen to twenty-five miles. All distances, of course, de-

*8th Reconnaissance Squadron.

pend on the nature of the terrain and the availability of the road net.

Zone

In wide, relatively flat, open terrain, these frontages might be extended considerably. In close, hilly country, with numerous intersecting roads, either the forward speed of the entire reconnaissance must be sacrificed or the frontage covered must be reduced. Side reconnaissance, lateral contact, and flank protection are the most difficult, and consequently, are the governing factors in the forward movement of a reconnaissance patrol. Taking these things into consideration, it might be deduced that the reconnaissance squadron can cover effectively a maximum zone of from sixty to seventy-five miles in width. This leaves nothing for special reconnaissance and only a small reserve. If this zone to be covered can be reduced to about forty to fifty miles, the squadron usually can be assured of having sufficient units left for special reconnaissance missions. This gives the division commander and the division G-2 something immediately at hand—a working reconnaissance agency to investigate suspicious areas and conform questionable reports without depleting his carefully planned reconnaissance teams.

Operation

Before discussing the forward speed of a vehicular reconnaissance unit, it is necessary to discuss briefly the method of operation of those units. The popular conception of a vehicular reconnaissance team seems to be a group of vehicles, either armed or unarmed, which rolls down the highways in a more or less haphazard patrol formation until some alert enemy with a machine gun or antitank weapon opens fire on the leading vehicle. The fact that one vehicle out of five undoubtedly will be lost in such operations seems to create no impression. The loss of that vehicle and crew is considered as a fair price for the information obtained regardless of how meager that information might be. Working on that theory, a reconnaissance section would then send back exactly five messages, and the last one would be brought in by the motorcyclist who is credited with enough brains to turn tail and run when the reconnaissance car is blasted out of existence.

The division commander who wants reconnaissance today undoubtedly will want more reconnaissance tomorrow. It is the duty of the reconnaissance commander to so train his units that they may be able to operate in such a way as to secure the maximum of information with the minimum of losses. This requires such a high state of training that replacements are almost nonexistent. The boldness of the lion must be tempered with the wariness of the jackal, and the team-work of the wolf-pack must be supplemented by the cunning of the fox when the pack is scattered.

Replacements cannot be placed immediately in responsible positions but must be worked gradually up through the organization until their metal has been tried, tested, and found true. A replacement is not a reconnaissance man. He is a soldier who has not been shown the rudiments of individual protection. He must be worked into the team after his arrival. Teamwork and perfect coördination are the essence of good reconnaissance.

Movement and observation, each dependent on the other, constitute the basis upon which reconnaissance is made. During the early stages of an operation, when opposing forces are at comparatively great distances, *observation* may be somewhat *subordinate* to *movement*. As the two forces approach within striking distance, however, the positions reverse and *movement* then becomes dependent on *observation*.

In a discussion of the reconnaissance elements of a division, a recent instruction pamphlet states in one paragraph that the reconnaissance troop should precede the division by a distance of from fifty to seventy-five miles. On another page, the distances are again stated as between fifteen and seventy-five miles. It seems possible that the upper limit of seventy-five miles is allowing the base runner to get too much lead off first base. A good left hander could pick him off too easily. From recent reports, both Adolph and Hirohito seem well supplied with southpaws. So many conditions affect this variable distance that it would be impossible to set definite limits that would not at some time or another be exceeded.

The more conservative Field Service Regulations says, "The reconnaissance squadron should operate far enough in advance of the motorized division to give timely warning of any hostile threat of such forces that might interfere with the mission of the division."

The most mobile force that can affect the mission of the division are the enemy armored units. They move fast, strike quickly and can do considerable damage. Most reports indicate that heavily armored vehicles have a top speed of between eighteen and twenty-five miles per hour, but no mechanized unit can move at top speed for any great distance.

A safe estimate would be an average of between twelve and fourteen miles per hour for the entire unit, unopposed but expecting resistance. Using these figures, the armored unit would then cover thirty-six to forty-two miles in three hours. Allowing one hour for the transmission of messages, this leaves two hours for

An outline of the tactical characteristics of the Reconnaissance Squadron and its ultimate use to further the mission of the Division as a fighting team—

the preparation of our mobile defense, provided that our reconnaissance agencies are forty-two miles in advance of the leading elements of the division. With tank destroyer units well to the front of the division columns, it is believed that this time should be sufficient to allow for organization of selected positions.

The time that might be secured by effective delay of the armored column has not been considered. The reconnaissance squadron is fairly well equipped with land mines, antitank guns, and demolitions to affect considerable delay on these columns. This then, allows a margin on the side of safety for the selection and occupation of the position upon which our defense is to be organized.

With these estimates as a basis, and allowing another eight miles on the side of safety, we can set our upper limit at about fifty miles. The lower limit of fifteen miles seems to be adequate to permit the deployment of the division without interference from the reconnaissance squadron.

Communications

For communications, the reconnaissance squadron must depend on radio and the motorcycle messenger. The squadron is equipped with both long and short-range sets. Panels in each armored vehicle are available for air-ground communications but are seldom practicable because of the speed with which reconnaissance patrols must operate.

Operators must be highly trained, and net discipline must be almost perfect. Continuous wave operation between the long-range sets is preferable to voice transmission, because it is more readable through local interference, and it also eliminates the chance of errors through poor pronunciation.

Division codes and cipher devices should not be carried because of the possibility of capture. Messages may be transmitted in the clear, but code names and template designations should be used to conceal the identity of subjects of locations. A short system of abbreviations, capable of being committed to memory, should be used—more to speed transmission than to confuse the meaning of the message.

In addition to the means at hand, both commercial and friendly wire communications should be used to the utmost, when available. Emphasis is placed on speed and accuracy of transmission, rather than on the means used. In moving into operation, radio transmission should be kept to a minimum. Radio silence, however, should not be imposed on any unit actually engaged in reconnaissance, as constant changes in locale sometimes affect transmission, and immediate radio contact must be insured for the speedy transmission of initial contacts.

The trains of the reconnaissance squadron should move by bounds and follow closely on the advance of the squadron. They contain the maintenance personnel, armorers, kitchens, and ammunition trucks. The motor maintenance vehicles are equipped for protection of the trains, and each maintenance crew is transported in a radio-equipped armored car.

Disposition of the trains can be made in two ways. Troop trains may be released from squadron control and may move along the troop axis of movement, or the entire squadron trains may be grouped under control of the squadron S-4 or motor officer and move along the axis of the squadron that is released to the troops to move up under cover of darkness. The latter method seems to offer greater control and more protection.

Except in extreme cases, the trains should be kept in concealed bivouac during daylight and should be prepared to move up under cover of darkness. If the advance is so rapid that movement in daylight must be made, new bivouac areas must be selected, and the trains moved by infiltration under protection of the maintenance cars.

Three-quarter ton cargo carriers in the squadron trains will allow part of the trains to move forward for supply of the troops under control of the motor officer. The remainder, under the squadron S-4, moves back to the division supply points for replenishment. If ordnance repair crews are attached to the reconnaissance squadron maintenance crews, then the long tow back to the Ordnance repair shop will be eliminated and valuable hours of darkness can be utilized for repair.

Advantages and Disadvantages of the Rcn. Sq.

One of the advantages of the reconnaissance squadron (like the cavalry) is its *Mobility* and *Fire Power*. Added to these are the improved communications that can be maintained by the electrically operated radio sets, and the protection afforded by the speed of the quarter-ton and the armor plate of the armored car. This gives a reconnaissance unit that can move fast, deliver a stinging blow when necessary, and report its information promptly.

As a disadvantage, it is a unit that, while not entirely roadbound, is dependent on fairly good roads for quick movement. *Motor vehicles are noisy, and this puts a distinct limit on their use for night patrols.* Motor reconnaissance must be supported closely if expected to seize and hold vital terrain features. Lastly, all motor vehicles present a difficult maintenance and supply problem that must be solved completely, if the unit is to remain in operation.

Rôle

The rôle that any reconnaissance unit plays in the theater of operations is dependent upon the mission assigned and the position of the parent unit. When the division is acting alone, the reconnaissance squadron may be called on to furnish reconnaissance to the front and flanks. This will present the hardest problem to the reconnaissance commander, as in almost every case, all of the troops must be used constantly. As battle is

joined, reconnaissance units withdraw to the flanks and move out and in, to report enemy rear installations.

When the division is operating as part of the corps on one of the flanks, the reconnaissance squadron must maintain close contact with the corps reconnaissance regiment and cover the exposed flank. In the initial stages a reconnaissance patrol may be detached to the interior flank as a contact patrol between adjacent divisions.

When the division is operating as an interior division of the corps, the reconnaissance squadron should usually be detached and used to augment the corps reconnaissance regiment. If not, it may be used to protect the division trains and cover routes for their forward movement under cover of darkness.

When the division is in reserve, the reconnaissance squadron should not be detached and used to supplement corps reconnaissance, but should be left at the disposal of the division commander for the reconnaissance of routes to both flanks and used to cover the forward movements of the division when it is committed to action.

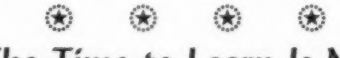
In some instances, the squadron may be used either by division or corps to cover the movement of a particular task force which has been assigned the mission of seizing important terrain features well to the front or flanks. These tasks are essentially the same as those assigned the reconnaissance troop in the triangular division.

The motorized division was developed in order that it might provide fast moving combat teams to follow up the advantage gained by an armored thrust. The reconnaissance squadron, therefore, must follow closely on the advance of the armored force, maintain contact with it, and seek out and report isolated bodies of enemy troops that might be left in its wake. Finally, it must push well to the front and flanks of the terrain feature to be held. It must be prepared to meet and report the size, strength, and direction of movement of any counterattack that might be launched. But in addition to all this, it must be remembered that the division commander will want positive information as to routes, bridges, and terrain.

Conclusion

It is well to enumerate the instructions and information that the reconnaissance squadron commander must have from the division staff, in order to accomplish the task assigned. First and foremost, he must have early information of the mission of the division and the division commander's plan of action. He should be informed at all times of the enemy situation and any subsequent changes. If he is assigned a dual mission, one must be given priority. If he is required to seize and hold terrain features, he should be reinforced by ground troops sufficient to organize the position to be held. As vehicle maintenance and supply is one of his most serious problems, some consideration must be given his unit as to priority on repair and replacement.

In return for this, the division staff can expect a thorough, fast moving reconnaissance; information of the enemy both positive and negative; first-hand information of roads, trails, bridges, and the general conformation of the terrain; and a reasonable delay of main enemy columns to allow the division time to prepare for action.



The Time to Learn Is Now

We frequently hear the remark: "They will learn to take cover when the first bullet comes," or, "Don't worry, those men won't do it like that when they are actually in combat."

Men who learn from the first bullet will only learn by fear and that is the wrong way. They will scuttle to earth and figuratively put their heads in the sand like ostriches. Some will be wounded or killed by the bullet that is supposed to teach them. Fear leads to panic. Confidence, which is so essential to success, is never found where fear is.

Men must learn *now* to take cover. Men must acquire *now* the physical stamina and determination which will enable them to continue to fight intelligently and correctly no matter how tired they may be. It cannot be too strongly emphasized that merely hiding is not the objective. The purpose of training in concealment is to teach men and officers to conceal themselves and still keep the enemy in view. It takes training to lie quietly watching an enemy, calm in the assurance that he cannot see you. It requires training to know the effect of backgrounds and it takes practice to learn how to use them.

It requires constant emphasis to make men realize that in this war the enemy may be expected on the flanks and in the rear just as surely as in front. Men and officers do not always realize that support platoons, elements of the heavy weapons company and the reserve company can expect fire from any direction and must dispose themselves to be ready for such fire at any and all times.—Colonel W. H. Wilbur, U. S. Army.

Notes from a Cavalry Regiment Overseas

by Colonel J. W. Cunningham

Preparation for Overseas

WHEN a regiment is alerted for overseas service, the first question to arise is that of equipment. Orders from higher authority require that it be limited to that specified in the Table of Basic Allowances. In general, this has proven satisfactory for a cavalry regiment. The six months' supply of maintenance matériel, however, as prescribed in the Table of Basic Allowances, is based on requirements of dismounted organizations. To these must be added certain supplies peculiar to the cavalry, such as neatsfoot oil, saddle soap, sponges, repair parts for machine gun and ammunition hangers, horse equipment, leather, etc.

To allow for the use of saddle bags in place of the infantry packs, a certain amount of adjustment must also be made in the prescribed plan for the packing of individual equipment. Changes in the normal packing of barrack bags A and B are necessary in order to dispose of the shelter-half and blanket, as they naturally cannot be carried in the saddle bags.

Among items not listed as prescribed equipment, but which should be included by a unit preparing for an overseas assignment, is a moving picture projector and generator.

Another item that should be mentioned is the matter of motor spare parts and accessories. Any regiment go-

Mangers and corrals constructed by the regiment

ing overseas should take all of them possible. They will be needed.

Should the band instruments be taken? Yes—by all means! Our Cavalry Band has been the greatest single morale factor, not only for this regiment, but for practically all neighboring units of all branches of the service.

Equipment must be packed in strong containers, marked as directed, with lists of equipment contained therein. In addition, a large and easily recognized identifying mark should be placed on the corner of each container. This will be particularly helpful in securing equipment upon debarkation.

During the period of preparation for overseas service, the closest attention should be given to the correct disposal of troop-owned property and the payment of bills —not only by organizations but by individuals. If insisted upon, this will eliminate much paper work after arrival.

Aboard Transport

The regiment embarked, and every attention was immediately given to the security of the vessel. All caliber .50 guns were mounted and manned, as were all 37mm guns. Calisthenics and "abandon ship" drills were conducted. In addition to the gun crews, a considerable portion of the command was occupied by police, guard, and kitchen details. Officers schools were conducted during the voyage. Duties of some kind were assigned to as many as possible in order to counteract the monotony of the days at sea under conditions of crowded quarters and limited deck space.

The usual blackout was in effect, and upon one occasion of an actual alert against submarine attack, the conduct of officers and men was excellent, and reflected their prior training.

Debarkation

When the promised land was reached, the regiment debarked and immediately marched to a near-by staging area, then promptly marched back again, to unload the ship.

At this point it was discovered that we had apparently landed in the original nest of "Ali Baba and his Forty Thieves." Property and Post Exchange supplies disappeared under our very eyes, and this situation was remedied only by the establishment of a heavy guard. If possible, all organizations should take their own Post Exchange supplies with them overseas.

Semi-Permanent Camp

After several days in the initial staging area, the regiment was directed to move to a more suitable location. This area proved to be a fortunate choice. Located in a broad valley through which run several crystal-clear streams, the site affords ample camp space, a drill field approximately the size of that at Fort Bliss, water, grass and considerable cover. Roads, bridges, corrals, feed boxes, and racks for long forage have been constructed. Kitchens have been screened, and are now equipped with concrete floors. Wooden frame mess halls are now screened and are fly-proof and comfortable.

Animals

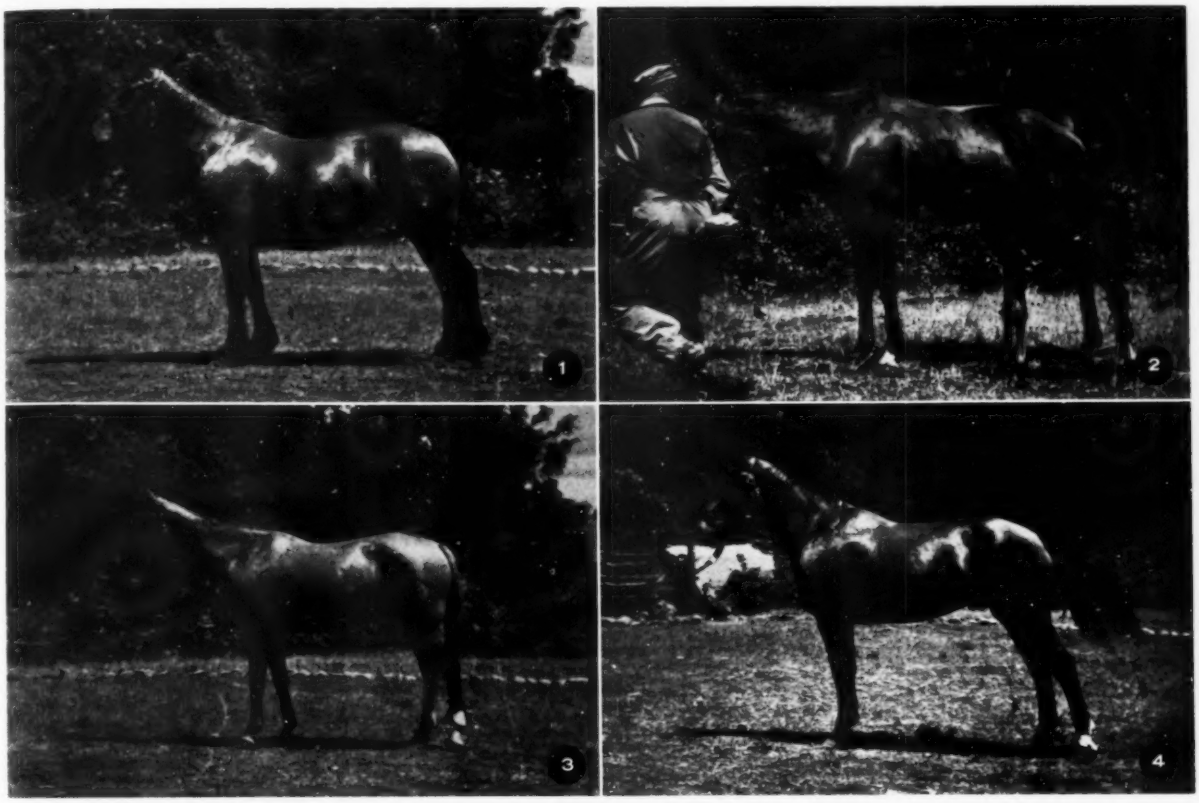
Upon arrival, it was discovered that approximately five hundred recently purchased animals had been torpedoed en route. The several hundred on hand were inferior in quality and in very poor condition. This situation was soon straightened out, and the regiment is now completely mounted. The conditioning of these animals has been a difficult task. Many of them arrived after their sea voyage with strangles or in such a condition as to make them unfit for duty for a considerable period of time. In addition, many of them, approximately four hundred, are under five years of age, and require careful handling. Very few of these animals were broken before they arrived, and there has been a heavy casualty list in the near-by hospital for some months.

The feed situation for horses has been another one of our problems. Oats have been furnished in good quality and in sufficient quantity. There has been little or no "hay" as we understood the word in the United States. The bulk forage has consisted for some months of chaff, which is nothing more nor less than chopped up oats and straw. It was found very unsatisfactory to feed this chaff in nose bags and some 200 twenty-foot feed troughs had to be constructed without delay. For the last few months the long forage has consisted of the oat stalk with the oat heads upon it. The result is that the animals eat the oats, pull out the straw, and trample a great deal of it under foot. This causes considerable waste. It is the opinion of all officers, including the regimental veterinarians, that the animals cannot do as well on this present long forage. It is deficient in nutritive value and should be replaced at the earliest possible moment, preferably by a roughage similar to the hay grown in the United States or at least by the chaff referred to above.

Approximately 60% of the animals show a great deal of thoroughbred blood. They have good heads and necks, long sloping shoulders, and straight legs. There is a strong tendency, however, to short sloping croups, and light bone. The high withers have been a source of trouble. Of the considerable number of small, stocky, draft-type animals received, a few have made excellent pack horses, but many are unsuited for use as either pack or riding horses because of their too-broad backs and almost entire lack of withers. Some of these have made excellent work horses, however, and all troops have developed good teams.

Training

Training has been based upon war department directives applicable to this theater of operations, and upon personal accounts of troops who have seen active duty. Much emphasis has been placed upon rifle firing at short ranges, conditioning marches, dismounted reconnaissance of the rugged terrain of this locality,



1—Draft type, used for riding, as pack, and work horses. 2—There is a high percentage of mares in horses received. 3—Good type trooper's mount. 4—A good pack horse of the draft type.

and hand-to-hand combat. Again, the bayonet has been a very useful weapon in preparation for this type of fighting.

Officers and noncommissioned officers classes are conducted, and in general our training has corresponded very largely to that required at home.

The regiment has been seriously handicapped by details and special duty requirements—varying in number from 100 to 300 men—which have been continuous since our arrival.

General

The climate of this locality is excellent. The health of the command, aside from the casualties incurred in breaking the remounts, has been excellent—comparable to that of our best located posts at home. Since June of 1942 there has been but one case of venereal disease incurred. This I believe is a record to be proud of.

The greatest problem now confronting us is the preservation of the present high state of morale which is maintained by keeping everyone reasonably occupied, yet providing time for such recreation as conditions afford. This cavalry regiment, trained to fight mounted or dismounted, intends to be ready to meet the enemy.

Many things hitherto unnoticed even by the thinking public have been brought to light, frequently with new emphasis and implications, through experiences undergone on the China and home fronts in connection with the present conflict. The usefulness of the horse in modern warfare is one of such discoveries. In reality, without the services of this dumb, faithful animal, Japanese troops would not have been able to carry out successful, daring attacks upon enemy positions, particularly in battles on the rugged steeps and in the narrow passes of the Chinese mountains. Contrary to popular expectations, the increasing mechanization of the army has by no means diminished the utility of army horses. The present hostilities have certainly established their distinct place in modern warfare.

From the April, 1939, edition of the *Tokyo Gazette*, a monthly report of current policies, official statements, and statistics of the Japanese Government published in Tokyo.

Superb Cavalry Mounts
From Soviet Horse Ranches*

REMEMBER how Belov's famous cavalry broke through the redoubtable Guderian's lines and sent the German "tank god" scampering back? Or the scores of other instances of shattering avalanches of mounted men that struck fear into the fascist troops and crumpled up their lines under the hoofs of superb horses to the accompaniment of flashing steel?

Everyone knows the punch of the mounted arm of the Red Army. Yet few stop to think what that punch is based on, where it derives—besides the valor and stamina of its men and the skill and grit of its commanders—the strength that has disproved all those "military theoreticians" who doomed the horse to oblivion as an important participant in frontline action.

To get to the source of the colossal momentum of a cavalry charge, one must turn to the far-flung regions of the USSR where the common, obscure horse rancher and breeder has spent long years in raising steeds that now have stood the country in good stead as a reliable battle reserve. Their persistent, stubborn work runs back for a long time.

*Moscow News.

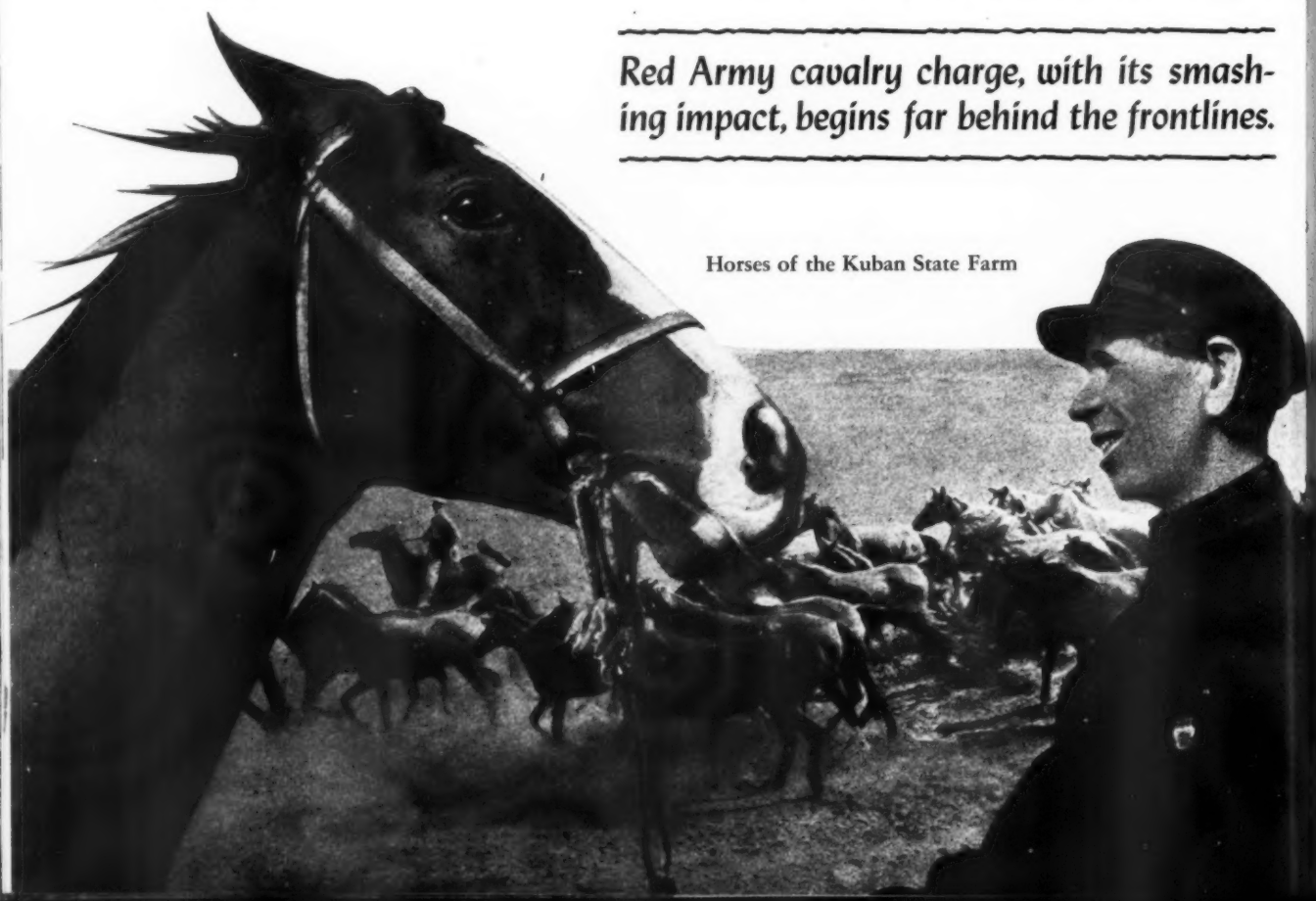
Vast Reserves

A large army of horses at the front—supplied in abundance by collective horse farms—requires vast reserves of remounts in the rear. The Soviet Union has these reserves, and even the months of war have not made much of a dent in them. In Siberia alone, there are many regions with 30,000 to 50,000 horses suitable for the army each year. What is more, these remount reserves are slated for a further increase this year, with the plan calling for a considerable rise in the number of head as against last year.

Incidentally, it must be remembered that not every horse is fit for service in the armed forces. Cavalrymen have their own requirements—only enduring and fleet-footed chargers will do for them—while the artillery evaluates its horses by their strength and plodding power. So it goes all along the line, with each arm presenting its own demands as to breeds. But they all must be superbly trained.

The Russian army has always been famed for its sturdy horses and skilled trainers. Field Marshal Suvorov made his cavalrymen especially train their horses to

Red Army cavalry charge, with its smashing impact, begins far behind the frontlines.



Horses of the Kuban State Farm

These Kirghiz horses, shown on a collective farm in Kirghizia, are descendants of the sturdy Mongolian breed.

cope with the bristling square that then was a potent tactical stunt on the battlefield. Great masters at training cavalry mounts are Cossacks and Caucasians, as well as the steppe dwellers of Kalmuckia, Kirghizia and Turkmenia, all of whom have added to their adeptness at the game during the last two decades.

Wide Range of Breeds

The tremendous variety of climatic conditions to be found in the Soviet Union is one of the factors that contributes to the fulfillment of the demands placed by the army. Thanks to them, the country has a wide range of breeds suiting the most varied requirements, from modest barnyard dobbins to pedigree pacers and heavy-duty draft horses. From the very beginning of Soviet large-scale stud farming, it has been placed on a scientific foundation. Specialization of a sort took place in the various regions, and each centered its attention on the breed best adapted to it.

The Cossacks of the Don, for instance, breed the famous Don strain of unexcelled cavalry horses. Though the Don breed has spread to many other regions, even as far away as distant Buryat-Mongolia, it is the Don area that still remains the main supplier of the breed that bears its name for the army.

The autonomous Soviet republic of Kabardino-Balkaria in the North Caucasus produces the local Kabardin breed, unexcelled for service in the mountains.

Turkmenia is the home of the Akhal-Tekin desert horse, hardy and enduring. Nor is it capricious as to food, which is a distinct advantage under frontline conditions. A few glasses of water and a couple of pork sandwiches will suffice for a day!

Gorky region and the Mordovian autonomous republic give us our Brabancons, well adapted for artillery, and Tambov and Ivanovo regions, our Clydesdales.

The central regions of Russia and the Volga area raise the Russian and Russo-American race horses, so popular in the army.

The thousands of horses of the famous Kirghiz strain, found in the cavalry units, are daily bearing out on the battlefield their reputation for stamina and speed.

The collective farmers are devoting themselves heart and soul to raising saddle horses worthy of the Red Army cavalry; they know that the lives of the men defending the country and their peaceful labor often depend on the animals they breed.

The Kirghiz horse is a descendant of the sturdy Mongolian breed that appeared in Central Asia along with the countless nomad tribes moving westward from Mongolia. This was the steed used by the invincible warriors of Genghis Khan in their thousand-mile marches, and, although not very prepossessing in appearance, it moves over mountain paths with the agility of a goat, can make a run of from 60 to 80 km. under a blazing sun without reducing speed, and if it so happens that the rider cannot provide fodder, will find its own food, for it eats anything its strong teeth can chew.

Evolve Improved Cross

Considerable work on improving the breed of the Kirghiz horse has been carried on in recent years. After

many experiments, an improved cross between the Kirghiz horse and English and Don strains, as well as the Oryol trotter, has been evolved, Kirghizia now has a splendid animal which, while retaining all the merits of the Mongol breed, displays the speed of an English or Don purebred on the race track and the endurance and power of the famous Oryol strain on the field.

Between 1935 and 1940 inclusive, the number of head of horses in Kirghizia rose by 48.7%—the number of cross-breeds increasing 3.5-fold. In the last two years, the number of head of improved breeds also increased considerably. This development came as a direct result of extension of stud farming in the republic. Whereas in 1934 there were all in all 127 collective farm stud sections in Kirghizia, by the beginning of this year their number had risen to 1,590.

The improved Kirghiz strains have gained renown far beyond the confines of their home in central Asia. Last year they participated in races at the country's biggest tracks, and turned in some splendid times. For example, one English-Kirghiz cross-breed covered the 1,500-meter distance in 1 min. 48.9 sec.

Though not much to look at, the tough and brawny Siberian horse—a relative of the famed Mongolian breeds—did good work last winter at the approaches to Moscow. This short-legged, low-slung war horse is a priceless cavalry mount particularly in winter conditions.

War Needs

This regional specialization, incidentally, played no small part in making it possible to render the maximum assistance to the collective horse ranches. Many collective farms in all regions of the USSR now have their own studs, while in regions where horse breeding has been most developed, there have been set up pedigree horse breeding stations, supplying the farms with colts and stud horses. These stations also propagate the best methods of raising horses, select the best breeds to raise in the given district and check up on pedigrees, etc. Besides them, there are the state-owned stud farms and stables, state farms, and race tracks, which play a big rôle in improving and increasing the remount reserves of the country.

A pureblood horse from the Don Region

A Soviet horse farm in Kazakhstan. These horses are quite similar to the Kirghiz strain.

The war has made some changes in the appreciation of a number of breeds of horses. For instance, some pure bred, pedigree strains turned out to be poorly adapted to the difficulties of campaigning in the field. Though the scions of famous record breakers are splendidly trained and taken care of, many of these "hothouse" products proved too delicate for the requirements of war. The cavalrymen at the front prefer local breeds—sturdy draft horses that combine fleetness with endurance and strength.

Love for horses and century-old experience at taking care of them go a long way in explaining the work of the breeders to whom the men at the front are so much indebted. It is this love, incidentally, that long before the war helped in building up horse breeding and establishing the collective stud farms, which have been of great importance in insuring the Red Army the equine reserves it needs. Perhaps one day there will be a memorial raised to the unknown horse fancier to whom the Red Army cavalry owes a good deal of its successes in battle.

The Campaign Horse

by Major Emil Engel, 2MC Cavalry

ABOUT the eleventh century, Genghis Khan overran more territory with his Mongolian type of horse (that could subsist on pasturage alone—winter and summer) than any conqueror of any time. His armies covered as much distance as a thousand miles a month, and up to eighty miles a day.

There are few horses today that could duplicate these feats, mainly because most of our horses are barn-raised. In the days of Genghis Khan, horses were what we call range or pasture-bred, and very few were barn-raised. For military purposes—then or now—the pasture or range-bred horse is far superior to the barn-raised horse.

An interesting example of the hardiness of the range-bred horse is found in the descendants of the "Barb," a breed of horse from the North of Africa with which early Spanish expeditions to America were often equipped.

About three hundred years ago, one (or more) of those expedition vessels was wrecked near the islands between Cape Lookout and Cape Hatteras, off the Carolina coast. The surviving horses either were washed ashore or swam in, and today their descendants are still there.

The islands on which they have survived have very few trees and no streams. The principal growth is a sort of marsh grass, but the horses have such an efficient digestive tract that they have assimilated enough from their relatively poor pasturage to propagate for more than two hundred years.

Barbs were selected for many of the Spanish expeditions, not only because they were numerous in the north of Africa at that time, but because they could subsist on "nothing." Also, they could move forward at a vigorous gallop and were strong enough to pack the weight. They were "easy keepers," "free goers," and galloping types. "Action carries weight"—and herein lie all of the essentials of a good campaign horse.

Balanced Physical Development

In breeding and raising horses that will meet campaign requirements, all of the animal's physical systems must be brought to a point of balanced development: his nervous system, which coördinates everything; the circulatory system, which brings oxygen and repair materials to all the tissues and cells, and carries away waste; the digestive system, which takes raw material and turns it into blood and lymph; and the muscular system, both voluntary and involuntary, which controls all movement—external for the work to which the animal is put, and internal, for the various processes of life itself.

Descendants of the early campaign horses of the Spanish conquistadores have lived on the sand banks off the coast of North Carolina for 300 years. They are believed to have come ashore from a wrecked Spanish galleon and have propagated on these relatively poor pastures for all of these years. They have the characteristic goose rump of the Barbs. These Spanish expeditions were outfitted with horses from the north of Africa. They are one of the foundation strain of the present English thoroughbred. Photo by author in August, 1941, at the Diamond Head Pen, Shackelton Banks, off Beaufort, N. C.

The size of the horse, likewise, must be in balance with all these systems. One of the worst errors in raising horses today is the practice of forcing the skeletal growth, without getting the necessary and corresponding growth of all the other systems. This produces an animal big enough, but without any physical vigor or activity. The race track is filled with thoroughbreds like this. "Early maturity, early decay," is an old saying on the track.

Pasture in Campaign

The best food in the world for growing horses is good pasture. There is no dry food that can equal it. If food is good for the *growing* animal, it is also good for the *grown* animal.

Pasture, both winter and summer, should form the basic food for all military horses. Dry foods should be supplementary. In practice, this is usually reversed, and barn feeds are made the basic food; and pasture, the supplementary feed.

Many will say that it is impractical to give horses pasture; that it disturbs army schedules and daily routine. The old officers, experienced in Indian campaigns, found a way to do it. In the cavalry, it used to be customary to have mounted drill and stables completed by ten o'clock. Horses were then turned loose in the corral, and the herd guard of four men, with an experienced stable sergeant in charge, assembled mounted outside the corral gate. The gate was opened, and the horses were quietly, and without urging, allowed to wander through the gate and were gradually herded out to the grassy drill ground, where they remained until shortly before afternoon stables. This gave them four hours of grazing—and any horse can eat a belly full of lush grass in this time. In the days when this practice was maintained, both hay and grain rations were very much reduced.

During campaign, our old cavalry officers worked out an excellent system that kept their horses in good shape without any shipments of either hay or grain. They were saddled up and on the march before sunrise. They marched until about ten o'clock, and then they went into midday camp for four or five hours. Horses were groomed and minor injuries touched up; then they were either turned out to graze or were picketed out individually.

The men had a heavy meal, washed and hung clothes on bushes to dry, bathed, and rested for several hours. About three o'clock, they saddled up and marched until about an hour before sunset. Then they went into camp for the night, and turned the horses out for night grazing.

In a hostile country, this method not only gave subsistence but also security. Men and horses were up and out long before daybreak and ready for any predawn attack. The camp in the middle of the day enabled the outposts to detect any approaching hostile force. Because of the short stay, even if detected, the bivouac was vacated by the time that the enemy was ready for an attack. When finally encamped for the night, there was only about one hour of daylight left for the enemy to discover the location. This method was used by General Crook during the Indian Campaigns and later again in Mexico by Colonel Dodd (who had served under Crook).

No. 1

***Lady Porter,* the barn-raised thoroughbred pictured above, is a "Free Goer" and a "galloping type." Not an "easy keeper" on winter pasture alone, she will stay in excellent condition on pasture from May to December inclusive, but falls off to unserviceability on winter pasture alone in late February and March. Photo shows her being ridden at the ordinary trot with a little collection. Reins stretched and jaw supple. No curb chain.**

The time has come when the tremendous military value of the horse in this war should be realized. In any discussion on the subject, the question always arises as to the difficulties of supplying our animals with hay and grain in distant theaters of war. This is not a problem at all. A horse *does not* require "high octane" forage to keep him fit to fight today, any more than he did 75 years ago. He can still be raised and trained on pasture forage and be strong and vigorous. It is absurd to think otherwise. It has been proved in Russia today.

Russia is the only country that is maintaining a large force of horse cavalry, and their horsemen, many of whom are descendants of the old Mongol invaders of the Genghis Khan period, raise and maintain their animals with pasturage as the basic food and dry feeds as supplementary.

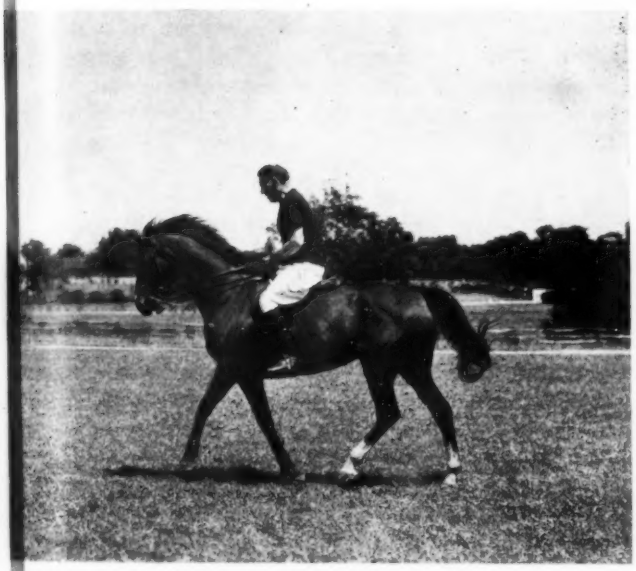
Winter Pasture

Winter pasture is now practically unheard of among our eastern horsemen. Very few know that the blue grass that grows so well in our eastern and middle states, when allowed to mature, will cure on the stem and make excellent winter pasture. The writer has kept horses for years, and is keeping them at this time, on such pasture. Although the barn door is always open, the horses, even on the coldest nights (ten and more degrees below zero) seem to prefer the outdoors and the winter pasture. Corn on the cob is fed merely to keep them coming into the barn, and for those barn-raised horses that have not the efficient digestive systems of the range or pasture-raised horses. When

hay is thrown down, they kick it about and go outside to eat, unless the snow is very deep and all of the grass is covered up. Even then, they will paw the snow away to get at the brown winter blue grass. These pastures consist of blue grass and white clover; the white clover disappears early in January but reappears again late in March.

An old veterinarian, who joined the First Dragoons in 1858 and went with them to Walla Walla, Washington, told the writer that when the grass was high enough for the horses to bite, they took the field; and they never returned until the snow drove them in. During this time, they never saw a bale of hay or a sack of oats.

Experience in maintaining horses in this manner is necessary so that one can calculate just how long the animals will maintain themselves on the amount of pasturage available. This necessitates moving to fresh pastures, unless the acreage per animal is very large. The great herds of horses used by the Mongols made a nomadic people of them.



No. 2

Same as number 1. Progress in training consists in sending up to the flexed jaw more and more muscular impulsion. This can only be done slowly from day to day. All the muscular impulsion that the mare was capable of receiving on the hand while holding a good position of the head, neck and shoulders is shown in this photo. The whole horse is shortened, and all the joints show more flexion and springiness. Her trot is cadenced.

During the growing season, one horse can be maintained on two acres of good pasture. The same horse in winter pasture from December first until April first will require at least another three acres, which should have been saved for winter pasture by not grazing it. The carrying capacity of pastures varies considerably because of the fertility of the soil and the amount of rainfall.

Energy and Sustained Effort

Exercise from birth, and all through the growing years, is as important as pasture. The healthy growing horse on good pasture takes exercise by instinct. This is a sure sign that the animal is growing properly; and if he does not exercise, it is a sure sign that something is wrong. This applies as well to the mature animal. When an older horse stops joining the herd in its regular gallops, he is ill or finished. The young healthy horse keeps galloping with brief intervals of rest for fully twenty minutes, and puts everything he has into the effort. The young horse that is always lagging behind most assuredly has had some interference with his growth.

Big pastures afford a better opportunity to study horses than do small paddocks. The ratio of the capacity of the circulatory system to the size of the horse has much to do with the vigor and recuperative powers of the animal. This is developed only during the growing years and only as a result of exercise. Obviously, the more energetic the horse, the better developed his circulatory system must be. This brings oxygen to the muscle cells, and the horse with the finer network of capillaries is able to get more oxygen to the cells than one that has not this development. The characteristic of the barn-raised horse, regardless of how well bred, is the lack of ability to make a powerful and sustained effort.

The nervous system, with its fine network of nerves, is also influenced in its growth by exposure to weather as well as by exercise. A windy country is a better horse

No. 3

Second generation of a pasture-raised mare. Sired by a two-year-old, half-bred colt that had not been altered and who covered a polo mare. Foaled in the field and raised with very little grain in the winter (one pound daily), she will stay in the condition seen here all winter long on nothing but winter pasture and will try playfully to buck you off. Although she is the same height as the thoroughbred in Nos. 1 and 2, her girth is twelve inches more and her weight is fully 100 pounds more. Photo shows her being schooled at the gallop to engage haunches under the body at every stride. She is not yet able to get the jaw relaxed from a muscular impulse and stops from full gallop at a touch of the bit. No curb chain. An "easy keeper."

raising country than one that is not subject to storm. The islands along the Carolina coast, where the Spanish ponies have propagated, is subject to the most violent storms and more ship-wrecks than any other section of our long coast line. Exposure to weather hardens men and horses. Starvation and deprivation of proper food and sleep only injure them. *Strength of nerve,* or the ability to work with a cool head under the most trying conditions of every sort, should be the outstanding quality of the military man and the military horse.

The capacity of the animal to stand up and work under short rations is determined by what is known as the alkaline reserve of the animal. Fatty reserve alone is not enough. The daily processes of life require lime, potassium, sodium, iron, and other minerals. These are in chemical combination with organic matter to perform certain physiological functions. When the horse is muscular instead of fat, and has pasture as its basic food, the alkaline reserve and vitamins are present. Nature puts its reserves to work in strengthening all the tissues of the body. Its reserves are not idle. When the animal is forced to work on a shortage of food, it is able to subsist on itself for a considerable number of days.

During the expedition in Mexico in 1916, the 7th Cavalry marched about five hundred miles in one month on ten days' rations for the men and horses. Horses were grazed, and the men picked up something from the country. Young horses, like young men, have not built up over a long period of years, big reserves that will stand up for a long period against hardship. Here is where the animal can surpass the machine. Where an older man or a horse shows a lack of physical endurance, it is only because they did not build their own reserve.

Speed

To meet the competition of the machine, horses must show just where and when they are superior. In new modern armies, the machine plays the bigger part and has set a standard of speed that makes it necessary to get more out of our horses.

Where foot troops are now expected to march twenty-five miles in eight marching hours, horse cavalry must be able to march fifty. This is easy if while on the march, the rider will always lead his mount wherever he can travel on foot as fast as the horse.

In 1902, there was a horse race (military) from Brussels to Ostend, a distance of eighty miles. The winner made the distance in four hours and fifty-five minutes. He alternately led his mare and rode her at a gallop. I saw this mare in France. *Courageau* was her name. She was a small, bay, high school mare from the French cavalry school, but she was small only in height, as she was fairly broad in front and behind and showed no signs of malnutrition or forcing during the growing periods. She was also an aged horse.

The ability to subsist on "nothing" is not enough for the campaign horse. It must also be able to move at speed. In Mexico, in 1916, I watched a troop of the 7th Cavalry of about forty men ride to its designated position after enemy action had started. They rode at a gallop of less than sixteen miles an hour, and in going about two miles those forty horses were spread over one mile by the time that the leading officer had arrived at his position. The horses were not thin. They had marched all day, however, over mountainous trails. The horse that the leading officer rode was a small, range-bred horse only recently purchased by its owner.

This inability to get up speed is not a question of breeding. The race track has plenty of race horses that hate to gallop. I have had a number of thoroughbreds that, when turned out in the pasture with my own pasture-raised horses, would stand still and watch them run. These horses were perfectly sound, young, and in some cases bred by the leading sire of the previous year.

Many of these lazy thoroughbreds reach the hands of polo dealers and are a disappointment. They have everything except the energy and vigor. Nearly all thoroughbreds are barn-raised, and I have never had one that could go through a winter pasture alone without losing so much in flesh that it affected the serviceability of the animal, while a pasture-born and raised thoroughbred, although not as tall, would stay in good flesh and even try by playful bucking to dismount his rider.

Conclusion

This question of vigor is a matter of the balanced development of the nervous and circulatory systems, while the question of living on "nothing" is a matter of the development to the highest point of efficiency of the digestive tract.

The plane and tank have become indispensable in warfare, and the horse is a valuable supplement to them. Mud, snow and slush, cold weather, and rain are things with which the pasture-raised horse grows up. They impede the animal very little. His food and pasture are native to most parts of the world.

The military aim should be to find a balance between mechanical and animal transport.

The great soldiers are the creative tacticians—General Arthur MacArthur. Maneuvers, American Lake, 1904.

Tactics change every five minutes—Napoleon.

Victory goes to the side with the last reserves—Napoleon.

Victory hangs by a thread—Napoleon.

All the above are still applicable to the present war. The horse now plays a very small part, but the part it plays may be the thread that gives victory to the side that has the creative tactical ability to use the animal that has played such an important part in the history of war.

SPEAKING IN JAPANESE

by Bruce Barnes

SERVE your country!—learn to speak Japanese. Nowadays there's a crying need for people with a knowledge of the language of the yellow race. And you can be one of these people if you're willing to devote a little time to conscientious study. The language really is not too difficult. In fact, you can learn enough in a few days time to get you by. Serve your country!—learn to speak Japanese.

The first thing to learn in any language of course, is correct pronunciation. Fortunately, in Japanese this isn't difficult. For the most part, I think we can say that consonants are pronounced as in English. Vowels, however, must be sounded according to the chart below.

"A" is pronounced like the *a* in *cart*
"E" is pronounced like the *e* in *shred*
"I" is pronounced like the *i* in *ski*
"O" is pronounced like the *o* in *below*
"U" is pronounced like the *u* in *blue*

Occasionally in a Japanese word a letter is doubled. (tt, oo, ii, pp, kk, etc.) When this occurs, in pronouncing the word you simply hold the *sound* of the doubled letter a trifle longer than you normally would if it were not doubled. (Thus, "i" is pronounced like the *i* in *ski*. But "ii" is pronounced like the "eeee"-sound in "eek.") This rule, incidentally, is true of both consonants and vowels.

Occasionally in your study of Japanese you will notice that a letter has a short dash (-) over it. This, too, indicates that the sound of the letter must be held a fraction longer than normal.

Bearing these pronunciation rules in mind, let us turn now to a few Japanese sentences which you may find it convenient to memorize. In fact, for best results, speak them out loud. You'll learn them more quickly and easily if you do. Our sentences then are:

Mizu ga hoshii .....I want water
Gohan ga hoshii .....I want food
Naifu ga hoshii .....I want a knife
Machi ga hoshii .....I want some matches
Empitsu ga hoshii .....I want a pencil
Uma ga hoshii .....I want a horse
Yofuku ga hoshii .....I want clothes
Zubon ga hoshii .....I want trousers
Sekken ga hoshii .....I want soap
Tabako ga hoshii .....I want a cigaret

From the above you can readily see that to express a desire in Japanese, all you need do is place the name of the object wanted in front of the phrase "ga hoshii." By knowing this little trick, you can easily make a meagre knowledge of the language cover a lot of territory.

Here is another expression you may need to know —along with the "formula" for using it.

Sore wa warui .....That is bad
yoi .....good
kirei .....clean
umai .....good tasting
kekko .....delightful—fine
kitanai .....dirty
mazui .....unpalatable
ōkii .....big
chiisai .....small
abunai .....dangerous

In line with the above, should you want to say "this," instead of "that," substitute *"kore"* for *"sore."*

Finally, here are a few common expressions and military terms you may want to know. Once again I suggest that you practice them out loud.

Konnichi wa ..... Good day
Konban wa ..... Good evening
Arigato Gozaimas .....Thank you
Kochira ye oide ..... Come here
Hayaku .....Hurry!
Hai or *E* .....Yes
Iye .....No
Ki wo tsukete .....Be careful!
Wakarimasu .....I understand
Wakarimasen .....I don't understand
Wakarimasu ka .....Do you understand?
Goran nasai .....Look!
Baka! .....Fool! (Don't use unless you want to start a fight.)

ki-hei is cavalry
tai ho is cannon or gun
yaku ho is cartridge
hohei is foot soldier
shikku suru is to gallop
tsuji is interpereter
seki ju jisha is Red Cross Society
shoju is rifle
noru is to ride
isha is doctor
teki is enemy
tomare! means halt!
tsuna is rope
kihei rentai is cavalry regiment
uma is horse
shageki is musketry
tzu is map
meirei is a command
tazuna is reins
kura is saddle
abumi is stirrup
kuruma is wagon

JAPANESE NIGHT

JAPANESE military leaders consider night attacks one of their specialties. In these, they were very successful in the Russo-Japanese war, the Manchuria "Incident," the China "Incident," and more recently in Malaya, Borneo, and the Philippines. They have experimented extensively with various night tactics, over a period of many years, and have adopted certain specific techniques.

As a rule, the Japanese have only limited objectives at night and do not attack very deeply. Once these objectives have been accomplished, the Japs usually effect a slight withdrawal, and reorganize for rest during the next day (except for reconnaissance or infiltration activities).

Although the Japanese admit that night operations result in more confusion and less control, they feel these disadvantages are more than offset by the advantages of greater mobility, secrecy of movement, and therefore greater surprise.

A Dutch officer, who escaped from Japanese confinement in Borneo, attributed the following statement to a Japanese officer:

"You Europeans march all day, prepare all night, and at dawn launch an attack with tired troops. We Japanese allow our troops to rest all day, while we reconnoiter your positions exactly. Then that night we attack with fresh troops."

Objectives

The objectives of Japanese night attacks usually are to locate and attack the front lines of the opposition with only limited or shallow objectives. "However, there will be times when it is necessary to attack the enemy's position in considerable depth," their manual explains.

Before the attack, each subordinate unit is given a clearly defined terrain objective. Objectives can be clearly defined only by thorough daytime reconnaissance, or by drawing hostile fire. Villages are avoided because they are difficult to attack at night.

Reconnaissance

Japanese regulations emphasize the importance of thoroughly reconnoitering terrain over which night operations are to take place, and of obtaining detailed information as to the location of opposing centers of resistance, machine gun positions, obstacles, and searchlights. The reconnaissances are made in daytime. Japanese patrols, frequently moving for long distances on their stomachs at a snail-like pace, get as close as possible to opposition positions without being observed. If they are unable to locate these positions exactly, they sometimes deliberately expose men to draw fire from the opposing forces so that the latter will give their locations away.

The patrols also select the points where the opposition's wires will be cut.

Sometimes, the Japanese make a second reconnaissance just before dark to satisfy themselves as to opposition positions, or to determine whether new positions have been occupied.

Formation of Plans

Japanese military leaders go into great detail in mapping plans for attack. This is doubly true for night operations. Particularly emphasized are march directions, methods of identifying friendly troops, liaison with adjacent units, the necessity for silence in order to achieve surprise, and flank protection.

Obstacles which would interfere with the attacks are removed by destruction squads—usually engineers—about an hour beforehand. This phase includes the cutting of lanes through barbed wire.

Approach Movements

In approaching, the Japanese select routes over which the troops will make the least noise. They generally move by column rather than in a line, in order to maintain as much control as possible up to the point of assault.

To maintain direction, the Japanese may use any or all of the following: compass, flares, rear lights—which give direction by alignments; searchlights or disappearing lanterns; markers, white stakes, strips of paper; lines of chalk, flour, or tape; and artillery shells fired for direction.

The Assault

Japanese techniques in the assault are quoted from their own manual, as follows:

"(1) *With limited objectives.*—When the attacking unit gets close to the enemy's position (the assault position), the commander orders a front-line group to assault. The remainder of the troops will quickly observe the general situation. For instance, if it is necessary to strengthen the front line with reserves, these should either attack the flank of the enemy, or enemy counterattacking troops. The commander watches for these opportunities, and leads the battle with firm determination. Placing reserves in the front lines thoughtlessly and unnecessarily will bring about confusion. This must be avoided.[1]

"At the start of combat, the commander of the reserves will send out liaison men to inform him regarding the movements of our assault echelons and the enemy situation, to connect the reserves with the

[1]Although the Japanese manual emphasizes the importance of holding troops in reserve during night attacks, in the present war the Japs have often thrown their full strength into the battle at the beginning.

ERATIONS

front-line unit, and to secure our flanks, rear, and front.

"When the assault has captured the enemy position, quickly organize your attacking forces. For example, the machine gun and infantry gun units take up their firing positions, security measures are taken, order is quickly restored and preparations are made to repel any enemy attack to recover the position just lost. The reserve commander will send out patrols as quickly as possible to the rear, flank, and front to determine the condition of the enemy, and he will be prepared for action with the remainder of his troops.

"The machine gun takes part in the night attack by occupying a secure position. Thus, it ordinarily cooperates with reserve troops in action, and may at times participate in the direct night attack, according to the opportunities for firing.

"When attacking by sheer strength, the machine gun is used to cut off enemy communication with other adjacent areas. Furthermore, it opposes the counterattack from other areas and concentrates its fire at the proper time. For this reason, the machine-gun plan must consider the coöperating fire plan of the artillery. The use of firearms will expose our plans, and it may bring hostile fire on our troops. There is also the danger of hitting friendly troops. Therefore, make thorough arrangements beforehand.

"(2) *Attack in depth.*—When attacking deeply in depth with two assault echelons, the front-line unit will capture the predetermined hostile position and take security and reconnaissance measures, restore order, and make arrangements for the enemy's return attack. It must prepare quickly to be leap-frogged by the second echelon of attack and always must make local conditions clear to this unit. If the first line unit receives a counterattack by the enemy, do not fire, because it would endanger the leap-frogging unit.

"The second attack echelon takes up the attack formation at the beginning, as a security measure. Before leap-frogging, it will put out security reconnaissance. Maintenance of direction will be considered after leap-frogging. In order not to get intermingled with the first echelon unit at the time of leap-frogging, the distance and intervals before and during the attack are controlled accordingly.

"The second assault unit of attack must keep in definite contact with the first-line unit, and keep itself informed of the enemy situation and the progress of the first echelon. It will be prepared to advance by leap-frogging as soon as the order arrives. At this point, do not come too close to the first-line unit because of the danger of getting into the lines of fire.

"The commander will determine the time when the second echelon must first advance to the attack from the place of departure. The time of advance will depend upon when the first echelon, leading out, has passed the second-line unit. . . .

"When the second assault unit captures the designated hostile position, the commander must get control of the unit quickly and then have the first assault unit advance to secure completely the occupied position. The remainder (the reserve) prepare for action."

Pursuit

The Japanese nearly always seek to capitalize to the fullest on pursuit. Even before combat begins, they have detailed plans for maintaining close contact with retiring forces. The following data on pursuit is quoted from their manual:

"The enemy will take advantage of darkness to conceal his retreat. It is important to gain early knowledge of this retreat by keeping a close contact with him. The battalion commander must make close reconnaissance, observe various signs, and always be careful not to lose the enemy. In order to clear up the possibility of an enemy retreat, do not hesitate to make a night attack with any necessary part of your strength.

"If the enemy's retreat is found out, the battalion commander quickly sends out a part of his strength for quick pursuit — the main force follows soon thereafter. . . ."

Machine Guns In Defense

"Because the development of battle during the night is very quick, it is necessary to put machine guns in positions where they will be able to concentrate their fire power on important areas to the front of the battalion's positions. The guns should be sited to have enfilade fire against the line of advance of the enemy, or in such a way as to be able to fire on a small, specific sector through which the enemy must pass. To obtain the most effective fire, machine guns are sometimes placed in the front line. Avoid placing guns separately at night. . . .

"Depending on the amount of natural light available, machine guns vary the firing method, and use night firing lights when necessary. . . ."

Retirement

"When you are retreating during the night, hinder the enemy's reconnaissance, and do not make any movements before darkness. According to the situation, make night attacks with small units, or have patrols to move about. These will help to deceive the enemy as to the true action you intend to take.

"As quickly as possible, make full use of the road with the main force, and concentrate your strength close behind the battle. Make sure that control will be well in hand by retreating in a column without confusion. . . ."

How to Use Your Eyes at Night

MODERN WAR is often fought at night. This means that men must learn to see in the dark—or at least to use their eyes in new and unfamiliar ways.

This article is written to tell you how to make the best use of your eyes at night. It will help you, whether your job is in an airplane or a tank, on a ship, driving a truck, or just getting about on your own feet.

It will not give you the uncanny eyes of an owl or a cat, but it may give you just the edge on the enemy you need to get in the first shot—and to get home.

You already know that when you go into a dark room from a bright one, it is hard to see until your eyes have become used to the gloom. At a movie it takes a minute or two to see the vacant seat. It may take another minute or two to be able to recognize a friend. During these minutes your eyes become more sensitive to the faint light.

Adjusting for Darkness

Your eyes adjust in two ways for seeing in the dark. One way is by opening up to let in more light or to make maximum use of what little light there is. This works in the same way as a camera diaphragm, which can be opened up wide for taking pictures in dim light. Your eye pupils open wide in dim light and close to a pin-point opening when the light is very bright.

But this is not the most important change in the way your eye works in dim lighting.

You actually have two kinds of sight. Your day eyes use one kind of vision cells known as "cones." They are principally located in the very center of the eye.

Your night eyes use an entirely different kind of cells, the rod cells, which are mostly around the outside edge of the eye.

The rod cells used by your night eyes are color blind. That is why "all cats look gray at night." If you see a colored light shining at night, and it looks red or green or blue, it is only because it is bright enough so that you can see it with your daylight eyes.

But your night vision is much more sensitive to light of some colors than to others. Red is seen equally well by night and day vision. Blue light, however, affects your night eyes 1,000 times as much as it does your day eyes. For this reason it is extremely dangerous to use blue lights in a blackout because it affects the enemy's eyes just as much as it does yours.

Night eyes lack the sharp vision for detail that your day eyes have. If you want to see to read, if you want to watch the dial of an instrument, if you must look at a map, a road sign, or your watch, then you must use your day vision. For this you must have good light—the more the better. Especially if the print or other forms are small, the light must be bright.

Night eyes are extraordinarily sensitive to faint light. This is shown by calculations that an ordinary candle flame could be seen at a distance of more than 100 miles if the night were completely black and if haze, dust, and the curvature of the earth did not interfere. A lighted match is about as bright as a candle flame. Under ordinary night conditions, a match can be seen from a plane for many miles away.

Night vision is not in use as soon as you step into the dark. It takes time—a half hour or more—before your eyes are completely adapted to the dark. When you leave a sunny street to go into a darkened theater, or step from a brightly-lighted room into the dark outdoors, you are completely blind at first.

Then several things happen. First the pupil of your eye dilates, letting more light into your eyes. This is a mechanical action.

Next the cones of your day vision adapt to the darkness. This takes about 5 minutes, and after that you feel more comfortable about moving around in the pitch dark.

After a much longer time, your rod vision adapts itself to the darkness and you can begin to see shapes and outlines in the gloom that were not even vague bulking shadows at first.

Just how this change-over from cone to rod cells is accomplished is not completely understoood, but it is at least partly a chemical process.

The soldier who, at a command or an alert signal, leaves a lighted room to run on duty without having prepared his eyes is completely at the mercy of the enemy insofar as his vision is concerned. By the time he gains the use of his night eyes, the emergency may be all over.

And even when your eyes are adapted to the dark, flashing on a light, even for a very short time, may ruin your night vision for another half hour. You can lose in a few minutes all you gained by half an hour in the dark. The brighter the light and the longer you look at it, the more you lose.

Getting Your Eyes Ready

Complete darkness is the best preparation for night fighting. It pays to protect your eyes from light before you start and while you are out. If you can't stay in darkness, keep the lights around you as low as possible and don't look straight at them. If it is necessary to look

at any lighted object, be as quick as you can about it. Experiments have shown that looking at an instrument dial lighted only by radium paint will cut down the distance at which you can see a friendly or an enemy plane by 50 per cent. Don't look at the dial any longer than you must or the loss will be greater.

Experienced gun pointers and spotters know that they must not watch the flash of their guns as they fire. The flash of a 6-inch gun may dull the eyes for a minute or more. Under continuous fire at dawn or dusk it is impossible to aim some rapid-fire guns accurately at a target more than 7 times a minute if the gunners watch the flash. At night the blinding effect would be even greater. Looking away from the flash gives almost complete protection. Luckily the flash of rifles and small-caliber machine guns has much less effect on the eyes.

There are several ways by which one can become dark-adapted or maintain dark-adaptation, even though working in a fairly bright light. Each method is suitable for certain types of jobs, and each has its limitations and dangers. A patch worn over one eye will keep this eye ready for night duty at any time, but vision from one eye alone is not as accurate as binocular (two-eye) vision, especially in judging distances of near-by objects. An individual may work in red light, or wear close-fitting red goggles, either of which are effective since red light has little effect on the rod cells and leaves one ready for nearly instant action in the dark. It is wisest to consult a medical officer concerning the necessity for such preparation, and the methods best suited for the task at hand.

Using Your Eyes Properly

Always remember that you must look a little to one side in order to see best on a very dark night. Learn to pay attention to things which are just a little off to the side. Learn to keep from looking directly at any object. As you feel your eyes drawn irresistibly toward what you want to see, just let them slide on over it to the other side and look again with the tail of your eye. It takes practice to learn to do this without fail, but it is worth the trouble to learn the trick.

And don't keep looking steadily to the same side of an object. This will make it disappear, too.

Try it out yourself and see how your eyes at night can play "parlor magic" tricks on you.

When in your darkened room or outdoors, hold up your finger and look steadily at it. It will disappear. Look a little to one side and it will appear again. But if you keep staring at this side it will soon be gone again. Move your eyes to the other side and back and it will reappear.

This means that in searching the sea or the sky for a dark object, you must look at first one area and then another. When you think you have spotted something, keep looking first on one side of the object and then at the other, or above and below it.

But don't try to sweep your eyes over the sky or the horizon—you can't see well while the eyes are moving. "Scan" the sky, don't sweep over it. Night eyes are slow in responding. At night, a faint object may not be recognizable until after you have looked near it a number of times. If you have ever hunted quail in the morning or watched deer in the dusk, you know that you can look right at such a camouflaged object for a while before you notice it. In darkness, such an object is even harder to pick out because you won't see it at all if you stare. You have to look again and again at points near it.

Contrast Helps Night Vision

Another thing that affects our vision at night is the contrast between an object and its background. If the thing observed is very different from its background, it is much more easily seen. An airplane may be clear if you look up at it against the night sky, but invisible if you look down on it against the dark ground. A ship may show up clearly against a star-lit sky, but fade into the background if you are looking at it against a background of dark water.

If light from the moon is reflected onto the under side of an airplane from white clouds below, the plane may become almost invisible from any angle.

To notice small differences in contrast, it is essential to have clear vision. It is for this reason that windshields must be kept clean and free of scratches or fog. These tend to scatter light in all directions and reduce contrast. Careless night fighters have been known to tolerate enough dirt on their windshields to double the time it takes to see a plane moving along near by. And sailors on ships sometimes let the salt from spray pile up in blotches on the glass. This is courting death.

For the same reason it is important to keep down the lights on your side of a windshield. Any light on your side reduces the contrast because stray light spreads over the whole glass and reflects in your eyes. That is why you push up close to a window when you try to look out at night. By coming up close, you shade part of the glass and increase the contrast of the objects seen through this part. If it is necessary to have any light on your side, keep it as dim as you can and screen it from the glass. This also helps your adaptation to darkness.

Vitamins

There has been a good deal of talk about the effect of shortages of vitamins A and C on ability to see at night. These are the vitamins in fresh vegetables, cheese, and fruit. People who don't get enough of these vitamins do become poor in night vision, but regular Army and Navy rations supply plenty of these vitamins. Occasionally, when boats are on long trips or when fighting lasts until fresh foods are all gone, a shortage of vitamins may occur. In these cases, medical officers will supply men who are likely to be on night duty with

vitamin capsules. Extra vitamins don't improve night vision if your diet or your night vision is already normal.

Night vision is affected by fatigue. Anything that reduces your physical well-being has a greater effect on night vision than on day vision. Experiments have shown that hangovers, slight illnesses, or excessive fatigue may double or even triple the amount of light needed to see an object. The night fighter must train for his job as a boxer trains for a big match. The boxer who is not at the peak of training is likely to be knocked out. The night fighter whose eyes are not at the peak of efficiency is likely to be killed.

Remember These Things

a. Protect your eyes from light before you go on night duty and while you are out.

b. Don't look directly at any light or illuminated object. If you must, be quick about it.

c. Use the corners of your eyes. Night targets are more clearly seen when you don't look directly at them.

d. Keep your eyes moving. Quick, jerky movements and short pauses are better than long, sweeping movements and long pauses.

e. Keep your windshield spotless and free of scratches and fog.

f. Keep yourself wide awake and on the alert. Don't break training. Use good sense about eating, drinking, and smoking.

g. Practice what you know about seeing at night until it becomes second nature to use your eyes to the best advantage. Use every possible device to aid you in learning to recognize ships, planes, and other important objects from slight cues.

Are Our Machine Gunners Really Experts?

*by Lieutenant Colonel Will J. Hayek**

NOW that periods for intensive, large scale maneuvers are again approaching, the question arises as to what further phases of training should be stressed. Perhaps that training most neglected, and (from all reports received) that which is most needed, is the ability to defend against attacks during periods of darkness.

The maneuvers of 1942 showed that our forces had improved in making the training realistic. They had improved in the use of camouflage. They had learned to put out guards and outposts that could alert the command in the event of the approach of an enemy force. But these improvements are not enough for 1943.

Could the maneuver outpost of 1942 hold off an enemy attack during the night, or during a period of fog or heavy rain—periods of poor visibility? Could effective fire be continued during darkness on the areas previously determined to be possible avenues of enemy approach, i.e., a bridge, a crossroad, or some pass in the hills? Could effective grazing fire be placed along a selected slope of a hill which our force might need to defend during periods of poor visibility? Was each machine gun still delivering effective fire along the final protective line instead of firing several feet too high because someone had accidentally shoved the gun?

In order to answer these questions in the affirmative, the soldiers operating the machine guns must have been trained in the technique of night firing, in addition to having fired the known distance courses.

Many former maneuver umpires can recall having heard from some noncommissioned officer in command of an outpost, an answer to the effect that his number one machine gun could lay fire on that bridge, and his number two gun could cover that crossroad; or that it would be impossible for the Blues to take his position by any attack from that direction.

Some umpire, who took his job seriously and realistically, may not have been satisfied with this fine answer. He may actually have gotten down on his "belly" and required the gunner to demonstrate and prove his sergeant's answer. So far, so good. That inspection may have sufficed for 1941 maneuvers. In the maneuvers of 1942, the umpires may have insisted on

*Office of the Inspector General, IX Corps, Fort Lewis, Wash.

the machine gunners furnishing and explaining range charts, and may have checked up on the selection of alternate positions by the platoon leader.

But now comes the supreme test—the maneuvers of 1943. Will they teach our machine gunners how to repel the Japs' night attacks and meet the need for the training suggested in "Fighting on Guadalcanal"? Our forces will be confronted with much of this type of warfare, for, as stated in this very interesting and illuminating booklet, the Jap, "when given his choice, operates exclusively at night . . . he attacks on a very narrow front, practically *en masse*."

If our force can have all possible approaches to the occupied area covered by machine gun fire at all times during darkness, a successful night attack by the enemy will be impossible.

Machine gunners who have fired the prescribed qualification courses have no trouble in registering on targets in the daytime. Those units having qualified gunners can be reasonably certain that an enemy attack in the daytime can be repulsed. At night, however, more is needed than merely the ability to fire the gun.

During the period subsequent to the registration of the guns on the target during daylight, the gun may have been accidentally moved. It may have been either depressed or elevated, and instead of covering the assigned target, the strike would then be in an area several yards away from it. This alteration would result in having no defensive fires to prevent the enemy from crossing the spot previously determined as a possible approach for hostile troops. Thus the enemy would be able to come through and carry on.

Again, a situation may arise where a first attack had been successfully repulsed by well laid machine gun fire, but in the excitement of the battle the machine gun had become inadvertently moved and no check had been made to ascertain whether it still covered the assigned target; so in a second attack, the enemy would come through at that spot, because it would not be covered. The gun, having been shifted by this accidental movement, would land its strikes in an area several yards away from the original target. It takes only a slight change in elevation to throw the center of impact of the shots 150 yards from the target—especially when firing at close range on level ground.

Our gunners must know how to check for this accidental movement. If the check discloses the gun to have been moved, they must be able to re-lay it at night, so that it will again cover the target on which it was registered during the day. There are several methods used for this type of checking and re-laying. Two of the most common are the use of the aiming stake, and the use of the night aiming box, also called night firing box.

Investigation has disclosed that some phases of this instruction have already been touched upon in some of the service schools. Unfortunately, many graduates of these schools—several of them serving with machine gun units—do not know any methods which may be used for this important detail, and the machine gun units themselves seem never to have had this brought to their attention! Possibly this is because not enough stress was placed upon this point, or possibly the student failed to grasp the importance of this training. At any rate, *our machine gunners do not know how to check for an inadvertent movement of the gun, and do not know how to re-lay it during periods of poor visibility.*

Field Manual 23-60, Caliber .50, Browning Machine Gun, Ground, goes into some detail on placing night firing devices and on the use thereof. If the reader, however, fails to realize the need for this type of instruction, and simply reads these references without studying them, he will not have learned what was intended to be taught. Neither *Field Manual 23-45,* covering the ground use of the light machine gun, nor *Field Manual 23-55,* covering the ground use of the heavy machine gun, contains any information on the use of night firing devices.

Each manual does contain brief instructions on laying the gun at night, during fog, or darkness, on final protective lines. Here, again, unless the reader makes a thorough study of the short reference and is inspired by a realization of the possible importance of this type of training, he will quite easily miss the point.

Since both the caliber .30 heavy, and the caliber .30 light machine gun, would be used as much, and probably more, against ground attacks by enemy personnel than would the caliber .50 gun, this instruction in *Field Manual 23-60,* on use of night firing devices, should be inserted in the other two field manuals. This information should be so well known and understood by every machine gunner that it would become second nature for him to check periodically for any inadvertent movement of his gun.

Conclusion

One of the goals for training in the maneuvers of 1943 should be for everyone armed with a machine gun to learn the technique of night firing. The wearing of one of the qualification badges for the known distance machine gun course, should not in itself satisfy any commanding officer that the wearer has learned to handle the machine gun during the night.

Our machine gunners must check the guns automatically and if a mis-alinement is found, then they must correct it by re-laying the gun to the sight setting as recorded on the range chart during the registration the previous evening. This can be done through the use of some night aiming device.

If our gunners have this knowledge, and are able to keep the fire of each machine gun on the assigned probable approaches of the enemy during darkness, heavy rain, fog, or smoke, it will then follow that a break-through laid down by the attackers will be impossible, and a successful enemy attack can be prevented.

TRAINING BRITISH TA

TANKS, born in the last war, have been developed in the present war to a state where they are now the object of all possible ingenuity in order to make them ever more formidable. As the tanks are steadily being improved to make them more effective in warfare, those who man them must be made as formidable as their tanks.

During training, this British Tommie keeps his balance high above a city street.

On parade, the tank soldier resembles—and often is—a soldier of one of the former crack cavalry regiments; for the Royal Armored Corps consists of the Royal Tank Regiments and all the Cavalry Regiments in the British Army.

At camps where men of the Royal Armored Corps are toughened to their jobs, exhaustive and intensive training is always in progress to turn recruits into "tank-minded" men. These men are taught to take their places in the crews, to honor their corps and its traditions, and to stand the strain of armored warfare.

The period of training, which lasts for several weeks, turns the raw recruits into tank drivers, gunners, wireless operators, fitters, and motorcyclists. Preliminary to joining the training regiments, the men take a six weeks course in the General Service Corps, where, while undergoing drill and weapons training, they are tested by psychiatrists to ascertain the jobs for which they are best fitted.

A tank is a messy monster, and the mechanic's job is never done. In the tank parks and repair-bays, close association with grease and oil is unavoidable, and these get into the men's back hair; but in the camps, where the trainees operate in slush and casual water, although there is plenty of mud, there is no muddle.

The men swarm up Jacob's ladders on the assault course; swing by ropes across rivers; scale cliffs and slide down them; cross swift streams on slippery logs; climb trees and drop from ropes, and plunge into underground labyrinths where they swim under muddy water in the dark. They come out grinning and covered with slime —their only covering a pair of thin shorts.

The tunnel they penetrate is sixty feet long, bored and built at the suggestion of the recruits themselves, whose ages range from eighteen-and-a-half to twenty-nine years. For the first forty-nine feet, the tunnel is two feet wide and eighteen inches high. Through this part, the soldier does a squirming crawl over dank earth. Then he takes a deep breath, drops into icy water thick with mud, and swims the last fourteen feet completely submerged.

The tunnel course is regarded as a sovereign test for claustrophobia—that dread of confined spaces which must never be part of the make-up of a tank soldier.

The men of the tanks work in crews consisting of a driver, a gunner, a wireless operator, and a commander.

The driver must learn to take his $80,000 worth of steel and equipment up hill and down dale without mishap. On a recent obstable track a good driver

TANK CREWS

*by Guy Innes**

charged his tank at an earthen bastion, poised it on the brink of a seven-foot drop and held it there for a moment, then let it drop gently to the ground on the other side. He never put a tread wrong. He took the first fence perfectly—a nasty slope covered with logs and other impediments—and eased his tank down the descent as if rocking his crew to sleep. Having taken an almost vertical barrier as skilfully as a fly on a wall, he came down gracefully at the water-jump, crept quietly through, and swept up the farther side. The last obstacle was a steep hill topped by a ditch which was protected by a dense hawthorne hedge. He could not see what was on the other side; but the tank paused with its nose in the air and came down on an even keel.

Training tank gunners is equally important but distinctly different. Instant reaction must be developed, lest the enemy get his shot in first.

For all tank crew members, physical fitness is imperative. "You don't know how heavy is the strain of modern battles," says an experienced officer. "We are looking for two things—guts and durability—to make these lads into real kill-the-Boche blokes."

Training puts four inches on men's chests if they are under twenty-five years old, and takes four off their stomachs if they are above that age. After two months of such training, a recruit's first battle-dress no longer fits him.

Scientific feeding is closely studied. On a sample day, breakfast is bread and margarine, sausage, bacon and beans, porridge, and tea; dinner is roast beef, Yorkshire pudding, two vegetables, rice and prunes, and tea; tea is bread, butter, jam, cakes, cold ham, chip potatoes, baked beans and sauce, and tea; supper is bread and margarine, fish cakes, chip potatoes and cocoa.

All training is carried out in the open air, and the camps are really schools rather than camps. Instruction is of very high caliber and is imparted by expert non-commissioned officers. It is even possible for the trainees finally to attain Sandhurst Military College and their commissions.

Whence come the recruits?

The Royal Armored Corps does not care, so long as the men are of the nature, quality, and substance demanded by the exigencies of tank warfare. On the whole, it is better to have come from a good garage than from the best college. But the Royal Armored Corps is composed of neither blimps nor snobs. If you are an Argentine volunteer or a policeman you will be equally welcome; and if your uncle happens to be a major-general it will not be counted against you. Into the same hopper all will go. The machine grinds exceeding small; and from the mixture that feeds it, there emerges in the course of months a level array of tank soldiers worthy of all the skill and care that has been spent upon them.

"Scaling Jacob's ladder" is a part of routine training. British training has become increasingly intense.

*British Information Service.

From the use of dummy ammunition, there grew the terry
From today's realistic training, the 1st Cavalry Division co[illegible]ne

"Damp Run on Battle"

ALL reports indicate that the battle efficiency of troops—even the actual lust for battle—rises immensely after the first taste of battle, regardless of whether the immediate result is success or set-back. Working on the theory that a small taste of battle now will lessen the shock of the real taste later, or even produce the beginning of a cultivated taste, the 1st Cavalry Division trains realistically for combat.

Training requirements are based on lessons learned from Stalingrad, Tobruk, and Guadalcanal. From them, we know that, in spite of the mechanization of modern warfare, the individual soldier is still the important element in the field army. We know that he must possess a high grade of physical endurance; that he must be skilled in the use of varied weapons; that he must be accustomed to fitting himself into the team-work of all the other elements of his particular group; that he must have confidence in the ability and courage of the other members of his team; and that he must have the confidence of his own courage and ability to "take it."

"The first baptism of fire is the final phase of training."
Secretary of War Stimson.

"Sweat now, that you may not bleed later."
Major General George S. Patton, Jr.

It is well known that the greatest shock to troops is their first baptism of fire, with the attendant full realization of all the grim hazards of battle. Our Army has sought to prepare the individual soldier in every way possible to withstand that shock in such a manner that he may continue to fight with the minimum of demoralization and the maximum use of all his faculties.

Battle Training Area

To bring this realistic kind of training to all personnel of the 1st Cavalry Division, a large battle training area has been developed east of Fort Bliss, Texas. The numerous box canyons in this area make it possible to use service ammunition of all types at numerous installations, without the dislocations and interruptions imposed by considerations of safety and restricted impact areas.

The accompanying sketches and air-photos indicate some of the numerous training installations or stations. These are enlarged, expanded and elaborated upon as the training progresses. The only limitations are in the imagination, energy, and ingenuity of the participating troops. Every bulletin of the war is likely to bring forth a new idea for the development and use of the battle training area. In general there are eight principal stations as follows:

1) The Mock Village, dubbed "Little Tokyo."
2) The Infiltration Course.
3) The Close Combat Firing Instruction Course.
4) The Unarmed Combat Instruction Area.
5) The Special Weapon Instruction Area, including booby traps, hand grenades, rifle grenades, land and antitank mines, home-made Molotovs, smoke, and "sticky" grenades, protective measures and gas.
6) The Field Firing and Platoon Combat Range.
7) The Camouflage Demonstration and Instruction Course.
8) The Stalking Range, which includes tank stalking, attack by stealth, and a course for application of close combat fire, combining fire and movement.

The area is generally assigned to a regiment for a period of one week, and this is divided to accommodate squadron combat teams in turn, each for three days. In this manner, the entire regiment obtains training on the course, and the squadrons become accustomed to working with their normal combat team attachments. Each squadron marches dismounted to and from the area, with arrivals and departures so timed that the area is in constant use. The movements to and from the area are planned as tactical exercises comprising at least 50% of work at night.

The bivouac area, which is about one mile from the main area, in itself is an important training installation. The bivouac is tactical and requires black-out and camouflage discipline, out-posts, sleeping in slit trenches, night command post raids, operation of messes under battle conditions, and individual cooking.

Every officer and soldier, having first completed preliminary training, including mechanical training, physical conditioning and known distance firing, will know what it is to live in this area for a few days; and what is more, he will probably return to it time and time again, during his current training.

Each of the stations is operated by a trained crew, consisting of one officer and the necessary number of enlisted assistants. These crews are prepared generally

★Commanding, First Cavalry Division.

...ry run"—a troop activity simulating rehearsal.
...new phrase—

by Major General Innis P. Swift*

by having them visit with the preceding unit and work on the various courses, so that they become skilled prior to the arrival of the troops they are to instruct.

Units arriving at the area are divided into the number of groups appropriate to the number of stations. In this way, all groups commence training at all stations simultaneously and, as one visitor put it, "There is never a dull moment."

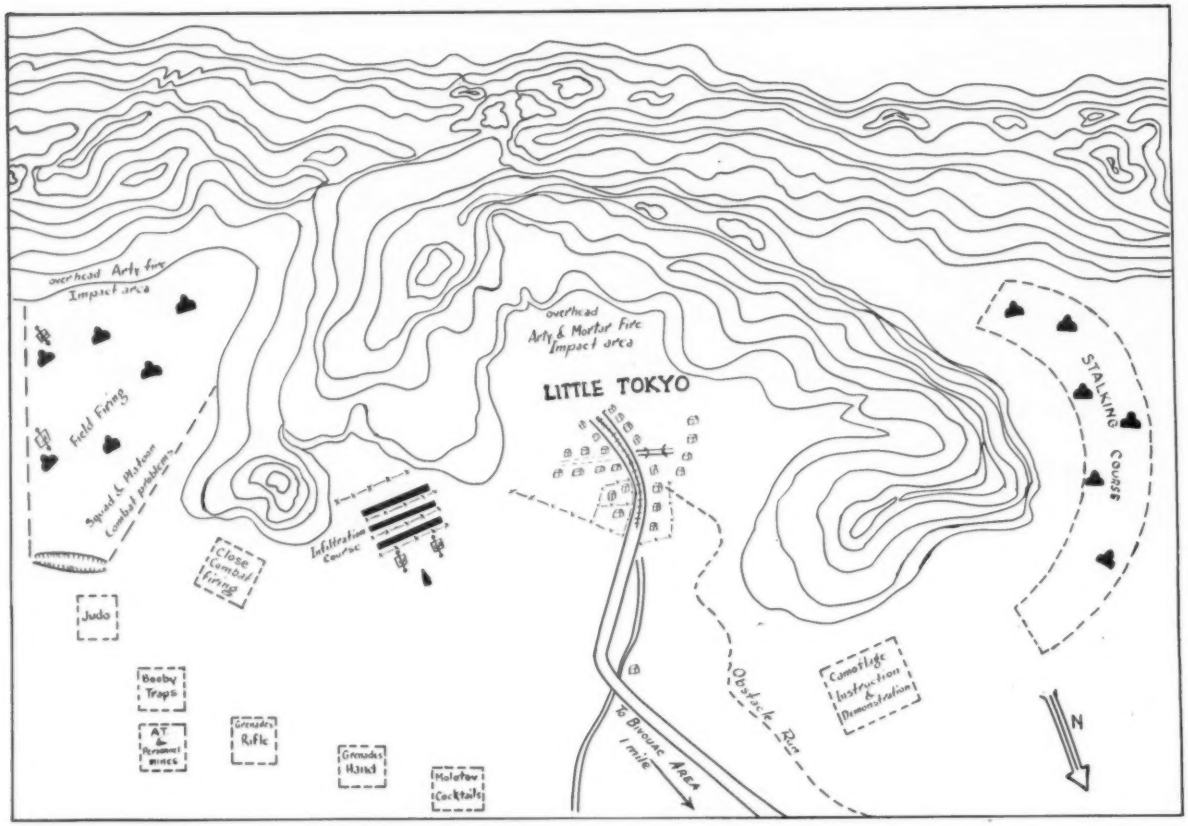
Groups progress from station to station in rotation, until every group has completed the training at every station. Group No. 1 starts at station No. 1, and finishes at station No. 8; Group No. 5 starts at station No. 5, and finishes at station No. 4. It generally takes at least two full days to run a squadron combat team through the entire course.

"Little Tokyo"

A visitor to the battle training area would probably be taken first to Little Tokyo, the mock village. Located in a box canyon, Little Tokyo consists of buildings mocked up from salvage lumber, and represents a very realistic little tough spot, tucked away in the hills. It is here that detailed demonstration and instructions are given in methods of forcing entry into the village under the fire of supporting weapons and with the assistance of demolitions. Then comes a house-to-house campaign to clear the village of the enemy. "Dry runs" are made in order to instruct in all details before ball ammunition is used. Demonstrations are staged in which the overhead supporting fire, artillery, mortars, and machine guns soften up the enemy strong points for the assault detachment.

The heavier fires are placed as close to the village as possible without causing its actual and complete demolition; the lighter fires are directed into the village itself at appropriate targets installed there. A system of wire

"The men are lined up at a firing point facing irregular terrain, dotted with stationary and surprise silhouette targets."



entanglements protecting the approaches to the village, requires the use of Bangalore torpedoes to facilitate the advance of the assault detachment. Pillboxes and machine gun emplacements are actually knocked out by 37mm fire, pole charges, flame throwers, and grenades. The assault detachment advances through a natural gully under the overhead fire of supporting weapons, and mortars provide a smoke screen to facilitate the final advance of the assault detachment from the gully and into the village itself.

The air is filled with smoke, dust, and the acrid smell of powder. (If this description sounds dramatic, remember that the purpose and intent of the course is to present the dramatic confusion of battle in such a village.) When the supporting fires are lifted on signal, the leader of the assault detachment dispatches his first team into the nearest building. Prior to this time, he has divided his squad or detachment into pairs or threes that will work together and in a pre-determined relative position to the base of the squad as it moves. The basic group of three men, working in a triangular formation, appears to be the most satisfactory for security, coördination, and control of the detachment as a whole. Regardless of the direction of the movement, there is always one man as a *point* with the other two covering and supporting him. Upon approaching a building, the point man throws in a grenade and, lying prone close to the building, is covered until the grenade discharges. Then, taking precautions against booby traps on windows and doors, he enters the building as rapidly as possible.

Up to this time, he has been covered by his teammates from possible sniper fire from other buildings. Upon his signal, the other men of his team in turn enter the building rapidly and prepare to proceed to the rest of the buildings by similar methods. In this system, the one moving is always covered by the other two. Meanwhile, similar teams are entering other buildings, so that eventually the street is crossed and the house-to-house campaign progresses on both sides of the street. There are plenty of booby traps and numerous fleeting targets representing snipers at windows, doors, and roof-tops. Aggressiveness and thoroughness are the key-notes of this instruction; speed is desirable, but is subordinated to thoroughness.

In Little Tokyo, the cavalryman, amidst the actual sounds of battle, is introduced to the reality of carrying out a mission in the most warlike setting possible, this side of the war itself. It is here that he begins to sit-in on the real game, so that he will have a chance for his chips when the cards are down.

Infiltration

The next station to be visited would probably be the near-by infiltration course. This course consists chiefly of a series of alternate trenches and low barbed-wire,

with shell holes, rocks, thorny brush, yucca plants and cactus scattered throughout. It is all hard and rocky ground; it is a crawling course throughout, and even without the firing and explosions is a nasty bit to go through. Two or three machine guns are mounted in line at the finish on platforms with bars. The bars prevent depressing below a safety limit tested by actual firing, and the guns deliver fire over the approaching troops at a height of eighteen to twenty-four inches above the parapets of the three trenches. Small bombs are placed in the scattered shell holes and are detonated electrically from a control tower.

Prior to this phase of training, the troops have spent a good deal of time learning to crawl under wire on various obstacle courses. Nevertheless, the training here also includes instruction on methods of crawling and keeping the body as close to the ground as possible. The technique of turning from belly to back before trying to go under barbed-wire, is demonstrated and practiced. The wire is very low—practically on the ground. This makes it necessary for a man to use his hands to lift the wire in order to go under. Men are cautioned not to crawl into the shell holes because they contain explosives; they are also cautioned that a hand, a knee, or a foot that is raised too high will probably get a bullet in it. Kneeling silhouettes, and sometimes balloons, are placed throughout the course to show where the fire is going. The course accommodates a platoon.

After all preliminary instructions have been completed, the men are lined up approximately thirty yards from the first trench. On command or signal, they run

"Machine guns open fire and keep a steady stream of hot lead constantly overhead."

"The instructor first demonstrates and then instructs the men in the use of a natural crouch with the weapon held tightly to the body."

at top speed for the first trench, hurdle a two-foot wire fence en route, drop prone in the trench, and start crawling. As an additional realistic caution to hit the dirt, a bomb is detonated as the line reaches the first trench. Machine guns open fire and, keeping a steady stream of hot lead constantly overhead, traverse over the course. The ⅓ dynamite stick bombs are detonated as they are passed. This tends to break up small groups that sometimes form at tough spots. There is no pause in the second trench. As a matter of fact, there is seldom any lagging anywhere; the impulse seems to be to go ahead constantly.

Upon reaching the last trench (almost under the muzzles of the machine guns), men remain there prone until the last man arrives. At this point, "sticky" grenades are thrown into the trench with warning, and the men come charging out, grinning through grimy faces, yelling and cursing, and assault the dummies at the machine gun positions. The men are dirty, bruised, and scratched. Their class X clothing, issued for the occasion, is torn to shreds. Their nostrils and mouths are clogged with dust. They know that they have been under actual fire!

Officers and men who have gone through this course shoulder to shoulder have a new confidence and respect for each other. There is a cocky assurance about them as they go on to other training, and they seek opportunities to go through the course again. They have learned how to go under fire, by actually going under it. The participation of officers is another step in their doctrine to "lead physically."

Two cautions about the course are important in order to prevent unnecessary injuries. First, test the sheaf of fire from each machine gun thoroughly, so that it may be close, but at the same time, perfectly safe for the man

who crawls properly. Second, clean out shell holes when charges are laid for each run, so that flying rocks and other fragments will not add an unnecessary and unintended hazard in the course. The charge should be laid on sand or soft earth. The properly laid charge may be set off within a few inches of a crawling man with no more serious effect than a good, hard jolt.

Close Combat Firing

Around a high rocky spur from the infiltration course is the close combat firing course. Everybody takes to this type of firing as a duck takes to water, because it is lively, and produces surprising results. This instruction prepares the soldier to fire his weapon instantly and by reflex when he moves in close combat at night, or in thick country. Firing is done with such weapons as the carbine, the pistol, the submachine gun, and the light machine gun. The work is stimulating, and skill develops rapidly.

The methods and phraseology of instructors are tough. Men are taught that the only safety is the trigger finger. Pieces are never locked. One NCO instructor demonstrated vividly what happens when the safety is on, in a pinch, and then said to his men in a doleful tone, "Mamma ain't got no little boy no more."

The men are lined up at a firing point facing irregular terrain, dotted with stationary and surprise silhouette targets at varied ranges from about fifteen to two hundred yards. Instruction is given on the range that is best suited to the weapon. The instructor first demonstrates and then instructs the men in the use of a natural crouch with the weapon held tightly to the body, so that it is at all times pointed the same as the man's nose.

When the men have finished the preliminary training, they practice with live ammunition and fire from fixed firing points on a firing line. Later, they move forward as a squad in assault, and during movement, fire at surprise targets. Firing at slight noises such as the creak of bobbing targets is included in this course. The ingenuity of instructors develops many interesting devices for this purpose.

Field Firing Range

About six hundred yards north of the close combat firing course is a large valley or cove in the mountain, which is used for field firing, musketry problems, technique of fire, and squad and platoon combat problems. The limits to directions of fire in this area are much more generous than the usual combat range. This permits fire and movement, the maneuver of squads within the platoon for flanking fire, and even a change of direction of the platoon as a whole. Fixed and surprise targets, controlled from pits, are placed in simulated defensive positions throughout the area. Overhead artillery and mortar fire is also used in this area for combined training.

Unarmed Combat

Upon returning from the field firing range, a group of soldiers can be seen moving at double-time (as all groups do in going from station to station) toward the unarmed combat instruction area. Here, the men are instructed in "dirty fighting"; it is definitely not a course in *judo*. The instructors demonstrate and have the men practice all kinds of disabling holds, throws, and blows that it is believed can be used effectively by the average man. They are taught to fight in the manner that is most natural to the individual, but they are cautioned that this type of fighting is the last resort and that the most effective way to kill is with a weapon.

"The men practice all kinds of disabling holds, throws, and blows."

The important thing in this course is to commence the breakdown of the American soldier's instinctive sportsmanship which inclines him to give the other fellow a break. Here, he is taught that the American soldier who goes up against a Jap or a German with a sporting attitude is a dead soldier. Another advantage in this kind of work, not to be overlooked, is that it adds to the physical fitness, strength, and toughness of the individual.

Special Weapons

Next is the special weapons instruction area, which is subdivided into a number of different stations. These include a mine field, where demonstration and practice in the laying of the field is conducted. Most of the work is with antitank mines. There is a booby trap demonstration where various types are shown, and their construction explained and practiced. There is also a course in which anything picked up, and wires tripped over, sets off a charge. The most effective demonstration of this course is given by the "booby squad," which goes through the course doing everything wrong.

Further along is a rifle grenade course, in which grenades are fired at mock-up targets at varied ranges. Every man gets to fire the AT grenade on this course. Near-by are courses where instruction is given in the various methods of throwing hand grenades.

Another area is devoted to instruction in how to

make and throw Molotov, smoke, and sticky grenades. Some of these home-made grenades are retained by the individual manufacturer and used later on the tank stalking range. Specially selected teams from engineer and chemical warfare troops assist in the instruction in this area. These teams put on the demonstrations which are suited to their particular function in combat.

Camouflage

The camouflage demonstration area includes installation, set up by engineers to show camouflage of gun positions, machine gun nests, and small ammunition dumps. Camouflage discipline is emphasized by the restriction of traffic to established trails. Soldiers going through this course are given camouflage suits and are required to demonstrate that they can approach to within ten or fifteen yards of observers and conceal themselves effectively. The ground and vegetation are so well suited to the demonstration that an observer can turn his back while the men are thirty yards away and when asked to turn around finds that the men have disappeared; when the men rise, he sees that they are practically under his feet.

Tank Stalking

The last principal area located in a valley separated from Little Tokyo by a high rocky ridge, is the stalking range. This range is designed for application with live ammunition under tactical conditions of the instructions received at various other demonstration and instruction courses. The tank stalking course consists of a tank park, mocked up from rocks, which is raided, in turn, by squads that have finished the course of instruction in the various home-made grenades.

Conclusion

Some of these courses are well established and have turned out hundreds of graduates; others are still in their infancy and will develop as time goes on. New ideas, fresh from the front, may produce additional methods to prepare men for the grim shock and confusion of battle. Whatever they are, they will be designed to produce men who can use their heads and use their weapons, because they will not be demoralized by sights, sounds, and smells that are entirely strange to them. Men are not afraid of familiar things; it is the mystery and doubt of strange things that tear at their courage.

When our trooper faces the first blast of enemy fire, he can say to his own soul, "Well, here it is; I know what it is like, and I know what to do." His realistic training will begin to pay dividends. He will have a chance for his white alley; he will go forward with courage and confidence in himself and his comrades. His "Damp Run" will have prepared him for battle!

"Here the men are instructed in 'dirty fighting.' "

"Quick On the Trigger"

by Colonel Walter F. Siegmund, Air Corps

We have drifted away from the technique of the greatest individual fighting men in our history—our pioneer forefathers, who carved out this great nation with the frontier six-shooter, the lever-action rifle, and the Bowie knife. The speed and accuracy with which they whipped their guns and shot the head off a rattlesnake, or drilled a bad man or savage, meant life or death. That was an age of kill or be killed.

Now, we are back again to an age of the rattlesnake, bad man and savage, and we must revert to the tactics and technique of our forefathers who wiped them out in their day.

SINCE the beginning of time, the element of surprise has been the foremost factor in warfare, and now, combined with mobility, speed, and fire power it makes modern warfare. The airplane has set the pace. It fulfills the mission of reconnaissance, observation, counterair attack, bombing, and transportation of personnel and supplies. It has changed naval warfare, and has cut down the days, weeks or months of artillery preparation of the last war. It has spread war over all areas and made the entire face of the earth the battle front. The tempo of war has been stepped up to a terrific pace as compared with the past.

But what of the individual soldier with his weapons? With all of the revolutionary progress in the tactics and technique of war, much remains to be done in training the individual fighting man in the art of gunmanship with the pistol, submachine gun, carbine, or weapons of similar character.

"Soldiers Must Be Made Into Gunmen"

Gunmanship of pioneer days has passed into mountain-top to mountain-top game shooting with a high-powered rifle and the telescope. Pistol shooting has become a holding and squeezing game, with the object of putting all the shots in the same hole. Some marksmanship has been practiced by a hunter rushing into an area where there is a heavy concentration of game, trusting to luck that a buck would run by, getting a shot in, and lugging the carcass out before somebody accidentally plugged him with a 30/30.

Others have joined the multitude who bedecked themselves with padded shooting jackets and gadgets, and after an amazing combination of pulling rabbits out of a dope book, judging or misjudging the wind, breathing, squinting and trigger squeezing—have sung out, "I fired only ten shots, and I got eleven bull's eyes in my target!" All of this is good, *but* it does not make versatile close combat gunmen.

The Cavalry Mounted Pistol Course was the only carry-over from the Wild West, and as an old horse soldier, I have prepared a combat obstacle course for the training of troops armed with the pistol, submachine gun, carbine, and weapons of similar character, to enable them to meet the conditions of close personal combat warfare, particularly in the orient where the Japs practice all the arts of the snake, rat, and the various members of the cat family.

Soldiers must be made into gunmen—gun pointers, instead of gun aimers. It is recognized that troops generally, and snipers particularly, must be trained in the fine arts of placing a bullet in the right spot with all of the aids available. But once the rank and file run into ambush, engage in jungle fighting or its equivalent, they fight where it's man to man, kill or be killed, and the technique of Wild Bill Hickok and of Billy the Kid is absolutely necessary to survive.

A Course of Military Gunmanship

A course for training with the pistol, submachine gun, and carbine has been constructed for the use of the Overseas Replacement Training Group, Army Air Forces Technical Training Command at Kearns, Utah.

The chart accompanying this article includes sufficient descriptive material for the operation of the course. Variations as to obstacles, number of obstacles, and target locations on the course, may be made depending upon the available facilities and terrain. The course must be laid out in a horseshoe form to insure one general direction of fire and at the same time, afford fire to the left and to the right. The course should not be longer than 125 yards, and the time limit should not be in excess of 2 minutes, depending on terrain, footing and type of obstacles.

In laying out the course, the general direction of fire should be to the front from the centrally located control booth. A line, drawn from tip to tip of the horseshoe across the open end, should be to the right of, and parallel to the direction of fire. Distance to targets should not exceed 25 yards.

Where large bodies of troops are to be trained, a series of these courses may be laid out with full regard to safety measures.

In the drawing, 15 targets are set up. When firing the carbine, a full clip of 15 cartridges and 15 targets should be used; or fewer targets, if desired, will allow 2 or more shots on any target. When firing the Thompson submachine gun, a full clip of 20 cartridges and 15 targets will afford 5 extra shots, which may be fired full automatic or otherwise on any of the targets designated by the instructor. When firing the automatic pistol, 2 clips of 7 cartridges each, and 14 targets, or fewer targets if desired, will afford 2 or more shots on any target.

Operation of Course

The scorer sits in the control booth. At the blast of the whistle, the soldier starts his run. After he clears the course, the scorer blows a whistle, and the pasting and marking detail run out (one man to each target) and each marker pastes his target, and calls out "Hit or miss on No. 1—Hit or miss on No. 2, etc." Each marker runs back to a line in the rear of the control booth after he has completed his work.

After the markers and pasters have all cleared the course, the scorer blows a whistle and the next man takes off.

A loud-speaker installed in the control booth will provide supervision, instruction, and correction from that point.

For safety measures, the control booth should be timbered against accidental discharge of weapons. If the control point is in the open, a sand bag nest, dugout, or other natural cover will suffice.

A competent noncommissioned officer should be in charge of weapons at the starting point. He will hand the soldier his weapon and clips. The soldier will proceed to the starting point, load his piece, take off the safety, and at the blast of the whistle, will proceed. The safety must be put on before the soldier leaves the ditch (obstacle No. 6) and left on through the crawl (obstacle No. 7), then taken off for firing over remaining obstacles. He will return his weapon and empty clips to the noncommissioned officer in charge at the finish.

Great caution must be exercised in the instruction of the soldier in regard to the method of carrying the weapon. If the man is a right-handed shooter, he must be instructed that on the first half of the horseshoe course, when the weapon is being fired to the right, it must be carried in a raised position in the right hand and *not across the body*. When he completes the first half of the horseshoe, and starts on the last half and is firing to the left, he must then shift the weapon across the body, and hold the carbine and Thompson submachine gun with *two hands*. This procedure is reversed if the man is a left-handed shooter. It is obvious that this procedure is necessary to prevent an accidental discharge of the piece toward the control booth, and in the opposite direction of the direction of fire.

In the event of a malfunction of the weapon, the soldier should stop on the course, raise his weapon and call, "Malfunction," and remain until relieved by the noncommissioned officer in charge. He should then return to the starting line, be given another weapon, and proceed over the course.

Dry practice runs should be held with combat field equipment and weapons to develop shiftiness on foot, dexterity with weapons and physical hardening in order that the soldier may gradually be brought up to the actual firing. The usual preliminary training with arms and firing on the regular type of range should be accomplished prior to firing on the combat firing obstacle course.

Below is a suggested method of scoring. It is based on a rating of 50% for a possible number of hits made, and 50% if the officer or board of officers conducting the firing declare a perfect performance. Judging should be on the basis that the course has been completed within the specified time limit; upon the manner in which the soldier handles his weapon, and negotiates the obstacles; and the ferocity, determination, craftiness and wiliness of his performance.

As an example, in determining the final rating, a man using the pistol makes 13 hits, which gives him 86%, as far as the firing record is concerned. If the judgment of the officers gives him a 100% performance, and he has completed the run within the time limit, his final rating will be the sum of 86% plus 100%, divided by 2, or 93%, which qualifies him as an expert. And as a further example, if he makes less than 9 hits, irrespective of his performance rating, and completion within the time limit, he will not be considered qualified. In other words, hits are a matter of fact; his performance, a matter of the directors' judgment.

Local conditions, available material, as well as terrain, and the ingenuity of individuals give a wide latitude in variations and innovations in the construction of a course and in firing procedure. The guiding principles, however, should be those that will result in hard, tough,

agile, mentally and physically alert, *deadly* gunmen, with full confidence in themselves and their weapons to the end that the individual soldier is unconquerable.

Procedure With the Pistol

1. At the starting point, the noncommissioned officer in charge will hand the soldier a pistol and two empty magazines. (For actual firing, two magazines loaded with seven rounds each will be supplied.)

2. The soldier will immediately assume the position of *Raise Pistol* and insert one magazine. At the blast of the whistle he will execute *Load Pistol,* without engaging the safety lock; then proceeding over the course, he will carry the pistol at *Raise Pistol* at all times except when actually firing.

3. The 1st and 2nd obstacles will be hurdled, and the first two targets fired on while running.

4. The 3rd obstacle will be cleared as a hand vault, and the 4th obstacle broad jumped. As the 4th obstacle is cleared, the soldier will go down on his knee, and fire on targets 3 and 4 from that position. When firing on more than one target from the same position, the direction of movement will be to the front.

5. After completing obstacle No. 5, the soldier will crouch low and fire from the hip on targets 5 and 6 from a crouching position. (During dry runs the next man will leave the starting point at this time.)

6. He will then jump into the trench (obstacle No. 6), and fire from the cover of the trench on target No. 7. Since this will be the last round in the pistol, the slide will remain locked in the open position. While under the protective cover of the trench, the soldier will remove the empty magazine by applying pressure on the magazine catch. The loaded magazine will then be inserted, the slide released by pressing upon the thumb piece of the slide stop, *and the safety put on.* From this point on, the pistol will be carried at *Raise Pistol* but will be pointed to the left away from the control booth. (In the case of left-handed trainees the procedure will be reversed. The first half of the course will be run with the pistol pointed to the right across the body and the last half at *Raise Pistol.*)

7. The soldier will then slip from the trench and run low to obstacle No. 7, where he will go to the prone position and negotiate the obstacle by using the "jungle crawl." Upon emerging from the undergrowth, *the safety will be taken off,* and target No. 8 will be fired on from a prone position.

8. Rising and running into the cover of obstacle No. 8, he will see target No. 9 on his left and will fire from a standing position.

9. As he comes out of the thicket, he will drop to his knee and fire on target No. 10.

10. As he moves off, target No. 11 will be sighted above him to the left, and he will fire on it with a quick shot from a standing position.

11. The soldier will then cross the stream ahead by running over a fallen tree, obstacle No. 9, and as he hurries toward the protection of the fallen logs, he will fire on targets 12, 13, and 14 with three running shots.

12. After clearing obstacles 10 and 11, he will return to the starting point. The weapon will be kept at *Raise Pistol,* the magazine will be withdrawn, and the pistol and both empty magazines returned to the noncommissioned officer in charge.

13. The soldier who has just completed the course will then return to his squad, and the next man will proceed to the starting point.

Procedure With the Carbine

1. At the starting point, the noncommissioned officer in charge will supply the first man with a carbine and one empty magazine. (For actual firing one magazine loaded with 15 rounds will be supplied in lieu of the empty magazine.)

2. The soldier will immediately grasp the carbine with the right hand as a pistol and will carry it to a position similar to, but slightly lower than *Raise Pistol,* and will insert the magazine. At the blast of the whistle, he will load the carbine by pulling the slide handle all the way to the rear and allowing it to snap forward. While carrying the carbine at the modified position of *Raise Pistol,* he will then proceed over the course.

3. The 1st and 2nd obstacles will be hurdled, and the first two targets fired on with pistol shots while running.

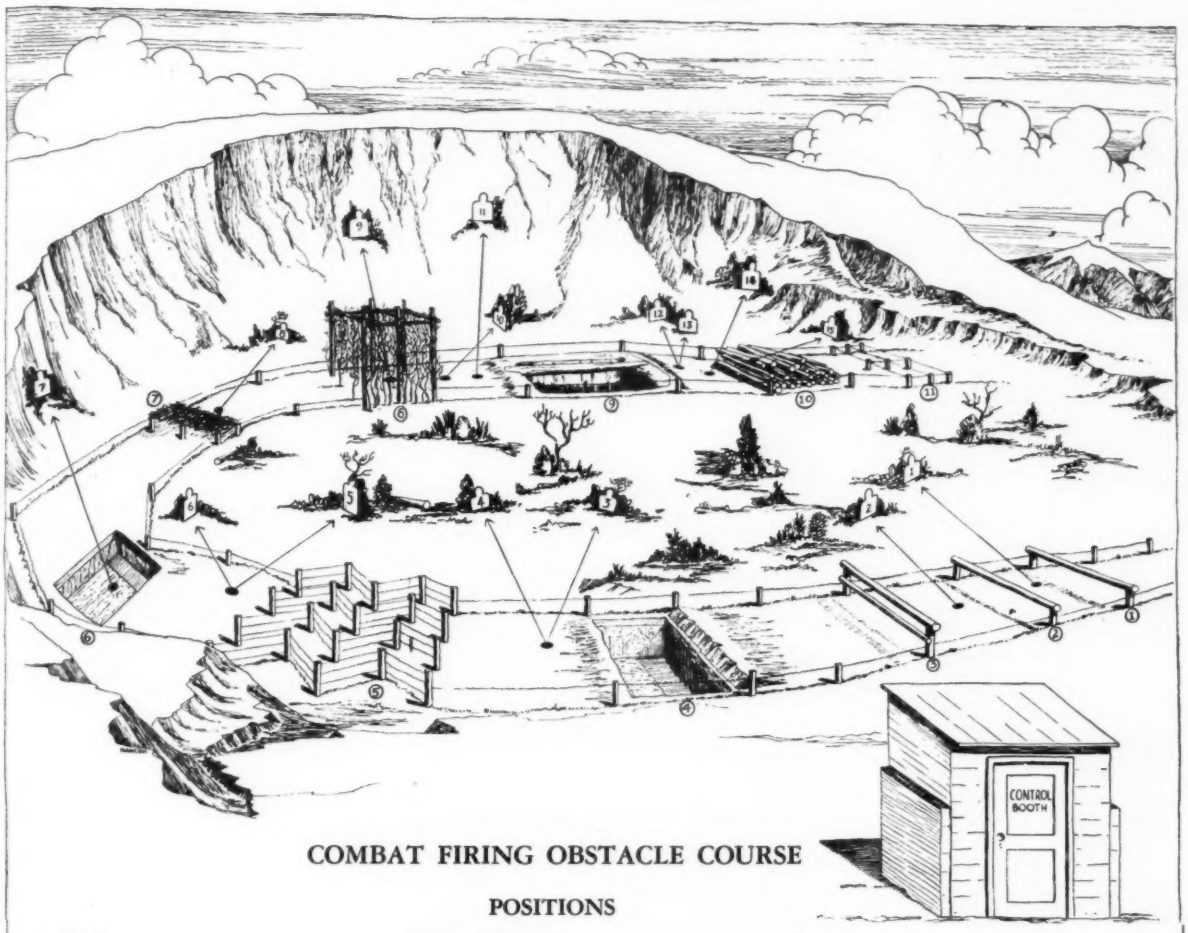
4. The 3rd obstacle will be cleared as a hand vault, and the 4th obstacle broad jumped. As the 4th obstacle is cleared, the soldier will go down on his knee, and will fire on targets 3 and 4 from the shoulder while kneeling.

5. After completing obstacle No. 5, the soldier will fire on targets 5 and 6 from the hip. (During dry runs the next man will leave the starting point at this time.)

6. He will then jump into the trench (obstacle No. 6), and fire from the shoulder from the cover of the

METHOD OF SCORING

	Pistol	*Carbine*	*Thompson Submachine gun*
100%	14 Hits—Possible	15 Hits—Possible	20 Hits—Possible
86%	13 Hits—Expert	13 Hits—Expert	17 Hits—Expert
75%	11 Hits—Sharpshooter	11 Hits—Sharpshooter	15 Hits—Sharpshooter
62%	9 Hits—Marksman	9 Hits—Marksman	12 Hits—Marksman



COMBAT FIRING OBSTACLE COURSE

POSITIONS

Carbine . . .	*Submachine gun* . . .	*Pistol* . . .
1 & 2—Pistol shots running	1 & 2—Standing from shoulder	1 & 2—Running
3 & 4—Kneeling from shoulder	3 & 4—Kneeling from shoulder	3 & 4—Kneeling
5 & 6—Standing from hip	5 & 6—Standing from hip	5 & 6—Crouching
7—Crouching from shoulder	7—Crouching from shoulder	7—Crouching
8—Prone	8—Prone from shoulder	8—Prone
9—Standing from shoulder	9—Standing from shoulder	9—Standing
10—Crouching from shoulder	10—Crouching from shoulder	10—Kneeling
11—Standing from shoulder	11—Standing from shoulder	11—Standing
12 & 13—Pistol running	12 & 13—Standing from hip	12, 13 & 14—Running
14—Standing from shoulder	14—Standing from shoulder	15—Prone
15—Prone from shoulder	15—Prone from shoulder	(Pistol to be swung on target at various angles. Direction of movement to front)

trench at target No. 7. The piece will then be locked on *Safe* by pushing the safety slide fully to the right. At this point, the piece will be dropped from the position of *Raise Pistol* and carried in both hands diagonally across the body. This carrying position will be used for the balance of the course. (In the case of left-handed trainees, the procedure will be reversed. The first half of the course will be run with the piece in both hands in the diagonal position, and the last half at *Raise Pistol.*)

7. The soldier will then slip from the trench and run low to obstacle No. 7, where he will go to the prone position and negotiate the obstacle by using the "jungle crawl." As he emerges from the undergrowth, he will unlock the piece and fire on target No. 8 from a prone position.

8. Rising and running into the cover of obstacle No. 8, he will see target No. 9 on his left and will fire from the shoulder at a standing position.

9. As he comes out of the thicket, he will crouch and fire on target No. 10 from the shoulder in a crouching position.

10. As he moves off, target No. 11 will be sighted above him and fired on with a quick shoulder shot from a standing position.

11. The soldier will then cross the stream ahead by

proceeding over a fallen tree (obstacle No. 9), and as he hurries toward the protection of the fallen logs, he will fire on targets 12 and 13 with two running pistol shots, then hesitate long enough to fire on target No. 14 from a standing shoulder position.

12. He will then take cover behind the log pile and fire on target 15 with a prone shoulder shot over the top log. Next he will clear obstacles 10 and 11 and return to the starting point. The weapon will be kept at the *Raise Pistol* position, and the magazine will be withdrawn. The piece and empty magazine will then be returned to the noncommissioned officer in charge.

13. The soldier who has just completed the course will then return to his squad and the next man will proceed to the starting point.

Procedure With Thompson Submachine Gun

1. At the starting point, the noncommissioned officer in charge will supply the first man with a tommy gun with bolt closed and one empty magazine. The noncommissioned officer will inspect the piece to be sure that the fire control lever is set at *Single*. (For actual firing, a magazine loaded with 20 rounds will be supplied.)

2. The soldier will immediately assume the position of *Raise Arms* and insert the magazine. At the blast of the whistle, by retracting the bolt, he will cock the piece, and then carrying it at *Raise Arms*, he will proceed over the course.

3. The 1st and 2nd obstacles will be hurdled, and the first two targets fired on from the shoulder while standing.

4. The 3rd obstacle will be cleared as a hand vault, and the 4th obstacle broad jumped. As the 4th obstacle is cleared, the soldier will go down on his knee, and fire on targets 3 and 4 from the shoulder in a kneeling position.

5. After completing obstacle No. 5, the soldier will crouch low and fire from the hip on targets 5 and 6. (During dry runs the next man will leave the starting point at this time.)

6. He will then jump into the trench (obstacle No. 6), and fire from the cover of the trench on target No. 7 with a shoulder shot. The piece will then be set on *Safe*. At this point, the piece will be dropped from the position of *Raise Arms* and carried diagonally across the body by grasping the fore grip with the left hand. This carrying position will be used for the balance of the course. (In the case of left-handed trainees, the procedure will be reversed. The first half of the course will be run with the piece in a diagonal position, and the last half at RAISE ARMS.)

7. The soldier will then slip from the trench and run low to obstacle No. 7, where he will go to the prone position and negotiate the obstacle by using the "jungle crawl." As he emerges from the undergrowth, he will *unlock the piece* and fire on target No. 8 with a prone shoulder shot.

8. Rising and running into the cover of obstacle No. 8, he will see target No. 9 on his left and will fire from the shoulder while standing.

9. As he comes out of the thicket, he will crouch low and fire from the shoulder on target No. 10.

10. As he moves off, target No. 11 will be sighted above him to the left and fired on from the shoulder.

11. The soldier will then cross the stream ahead by running across a fallen tree (obstacle No. 9), and as he hurries toward the protection of the fallen logs ahead, he will hesitate long enough to fire on targets 12 and 13 with rapid hip shots. Swinging to the front, he will sight target 14 and fire on it from the shoulder.

12. He will then take cover behind the log pile and fire on target 15 with a prone shoulder shot over the top log. After clearing obstacles 10 and 11, he will return to the starting point. The weapon will be kept at *Raise Arms*, the magazine will be withdrawn, and the piece set on *Safe*. The piece and the empty magazine will then be returned to the noncommissioned officer in charge.

13. As there are only 15 targets on the course, when the soldier is actually firing the Thompson submachine gun with 20 cartridges in the clip, the instructor will designate any target on the course which may be fired on full automatic, and thus use the extra 5 cartridges in the clip.

14. The soldier who has just completed the course will then return to his squad and the next man will proceed to the starting point.

Notes for Use of Course

1. Mechanically operated bobbing and surprise targets may be used depending on facilities and terrain.

2. Variation in types of obstacles should be confined to such characteristics that will not destroy the primary object of developing versatile gun handling.

3. Length of course should not exceed 125 yards.

4. Distance from firing points to targets should not exceed 25 yards.

5. Hits on targets should count 50 per cent of rating. Performance and "way of going" should count 50 per cent of rating.

6. Time of run per man should not exceed 2 minutes.

7. Method of control and scoring, same as mounted pistol course.

8. Preliminary training on regular range should precede actual firing on combat firing obstacle course to familiarize men with functioning and firing of weapons.

9. Series of dry runs with weapons and combat field uniform and equipment should be run before troops are allowed to fire.

10. For dry runs, as many men as can be instructed and controlled may be on the course at one time. Obviously in firing, only one man on course at a time.

11. A loud speaker in control booth will facilitate supervision of instruction and firing.

Motorcycle Endurance Run

*by Lieutenant Bernard A. Walsh**

THE largest motorcycle school in the United States is operated by the Motorcycle Department of the vast Armored Force School at Fort Knox, Kentucky.

It teaches students to take cycles apart and find out what makes them tick. The soldiers are taught to do everything from repairing a puncture to straightening a bent frame.

Riding is incidental in the school's instruction. Men are required to be able to ride only well enough to test the vehicles they repair. Most of them, however, have found that riding is fun, and they want a chance to continue the sport while training.

Extra-curricular activities, popular with officers and men of the school's motorcycle department, include occasional endurance runs. Typical of these was the most recent, in which 105 mud-spattered, rain-soaked enthusiasts rode, pushed, and lifted their heavy cycles over 61 miles of northern Kentucky's sticky red clay.

The course followed secondary roads on the Fort Knox reservation and near-by areas. A two-day thaw that followed snow and cold had made the course a morass of mud. Then to test to the limit the mettle of these messengers of mechanized warfare, a cold rain beat down during the latter stages of the contest.

At one point more than 30 machines were mired in the same quarter-mile-long mud hole. Some of them bogged down permanently at this point and failed to finish.

The run was over a route unknown to the contestants, who were assisted only by a crude map and an occasional road sign. The tough going was designed to equal the worst conditions to be found in combat areas. In the words of an officer who laid out the course, "If the men can follow secondary roads, go through woods and mud with a poor map, they can be trusted to get from here to there in battle."

Chief objectives of the endurance run were these:

1. To test the condition of men and machines.
2. To test the ability of individuals to follow an unfamiliar route guided only by the most simple directions.
3. To test the ingenuity and ability of the soldiers to get the most out of their machines with the expenditure of a minimum amount of gasoline.
4. To impress on the armoraider mechanics the necessity of keeping motorcycles in condition for the difficult tests they must face in combat.

The run was started at 10 o'clock on a Sunday morning, and riders took off at one-minute intervals on alternate courses. Even-numbered cyclists followed the reverse of the route taken by the odd-numbered men. It was well after 3 P.M. before the early finishers began arriving.

Two cycleraiders wrestle through a sticky spot on the Armored Force School's endurance run. At times as many as four or five riders teamed up to push their clay-captured mounts through "General Mud's" tougher traps.

The ride was not a race but a competition against calculated time. The schedule called for riders to average 15 miles an hour. But these plans were made without consulting the weather man. The winner's elapsed time was five hours and seven minutes, an average of some 12 miles an hour.

Each man's score was computed in points, every rider starting with 1,000. A point was deducted for every minute late or early in arriving at a check point, of which there were six; two points were deducted for each minute early a rider left a check point, and 100 were lost for missing a check point.

In addition, a point was trimmed off the rider's score for every ounce of gasoline expended over an amount estimated in advance to be sufficient for the course. It was his saving on gasoline that gave victory to the winner, who lost only one point for excessive gas consumption, while most of his competitors lost from 50 to several hundred.

Chief complaint of all riders was that the sticky clay collecting between the front wheel and fender, packed so tightly that the wheel couldn't rotate. One cyclist reported he was forced to stop 50 times to clean his wheel.

One of the few who found a way to overcome the mud menace explained his success in these words: "I rode through all the water I could find and let the water clean my wheel for me." He had to stop only once to scrape off the clogged mud.

There were only four instances of mechanical failure. Each consisted of a burned-out clutch resulting from inexpert riding.

In summing up results of the run, it was definitely proved that if a machine is ridden and handled properly, it will negotiate the most difficult terrain.

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*Armored Force School.

Preventive Maintenance Personnel

by Major Henry G. Bell, Cavalry*

INSPECTIONS reveal that in each 100 military vehicles selected at random there are approximately 1700 defects because of a *lack of preventive maintenance.*

What is preventive maintenance? It is the maintenance that must be performed to make sure that vehicles are always available to move men, guns, ammunition, and supplies. Preventive maintenance is "the ounce of prevention *and* the stitch in time."

Who performs preventive maintenance? Drivers and mechanics in the troop, squadron, and regiment—under the supervision of their officers and noncommissioned officers.

When is preventive maintenance performed? Daily, weekly, monthly, or every 1000 miles, and semi-annually or every 6000 miles, as a general rule.

Why is it that so many defects are found in our military vehicles when, to begin with, they are the best vehicles any army possesses? The answer is improper *selection, training,* and/or *supervision* of drivers and second echelon maintenance personnel.

Selection of Drivers

Most men, with proper training and supervision, make good drivers. There are a few, however, who because of physical defects or poor judgment will never become good drivers. These should be weeded out early in the training period, regardless of how hard they try or how good otherwise they may be.

Training of Drivers

During their basic or unit training, most drivers have undergone the *minimum* training as outlined in FM 25-10 or TM 21-300. In many cases, they have memorized the list of prescribed duties of the driver and will recite them to their superiors verbatim. They can drive excellently on secondary and better roads.

A military driver, at the end of an eighty-six hour course, usually cannot be classed as an expert driver. Training must continue on every march, every short trip for rations or supplies, every small problem, every phase of maneuvers, and every battle engagement. When the going gets tough, the duties of a driver are doubled and redoubled; his training for the first time has become intense and real, and his appreciation of good maintenance begins.

Many drivers lack sufficient training in negotiating shallow streams, deep ruts, gullies and ditches, stumps, logs and small trees, sand, mud and soft ground, thickly wooded areas and narrow, crooked roads. The use of traction aids such as chains, corduroy mats, brush, winches, and snatch blocks has been omitted in the driver training program of some organizations.

Road reconnaissance in combat areas will usually reveal that bridges and road crowns are in poor condition. A lack of training in difficult operation results in

*Instructor, Department of Motors, The Cavalry School.

Students in the advance course practice maintenance in the field.

the worst kind of vehicle abuse, causes an extra burden on second echelon maintenance units, and reduces the time that should be devoted to preventive maintenance operations.

Supervision of Drivers

Corporals, sergeants, platoon leaders, troop and higher commanders fail to supervise and inspect driver performance properly. The 1700 defects in each 100 military vehicles is the evidence.

The place and time for thorough supervision and inspection of driver performance is the same as for driver training. Supervision is necessary on every march, every trip for rations and supplies, every small problem, every phase of maneuvers and every battle engagement.

The driver is with his vehicle one hundred per cent of the time when it is in operation. He performs the most important part of preventive maintenance, and the success or failure of a mechanized unit depends largely on expert driver performance. The secret of good driver performance is *expert supervision* and *inspection* by all concerned.

Selection of Second Echelon Maintenance Personnel

On June 11, 1942, a committee, made up of representatives from service schools and replacement training centers, met at Headquarters, Replacement and School Command, Birmingham, Alabama, and discussed matters pertaining to the training of second echelon motor specialists. They recommended that for prospective students of service school motor courses, the *minimum* qualifications should constitute the following:

1. For Officers' Motor Course.
   - (a) Troop grade and age.
   - (b) Qualified vehicle operator.
   - (c) Desirous of attending the course.
   - (d) A minimum mechanical aptitude test score of 110.
   - (e) Possession of mechanical background as evidenced by one or more of the following:
     - (1) College training in mechanical engineering.
     - (2) Experience in the operation and maintenance of commercial motor vehicle fleets.
     - (3) Any other comparable experience.
   - (f) Graduation from an Officer Candidate School or from an Officers' Basic Course of a Special Service School (desirable but not mandatory).

2. For Enlisted Motor Course.
   - (a) Qualification as motor vehicle operator.
   - (b) Desirous of attending the course.
   - (c) A minimum mechanical aptitude test score of 90.
   - (d) A minimum AGC test score of 90.

Group of students in engine course study tune-up and trouble shooting.

   - (e) A grammar school education or its equivalent.
   - (f) Indicated ability to perform duties of a non-commissioned officer.

Four out of ten students now enrolled in the Cavalry School Motor Course do not have motor vehicle operators' permits and cannot be permitted to operate a vehicle. This means that motor officers and motor mechanics cannot be trained thoroughly in two very important operations: road testing and trouble-shooting.

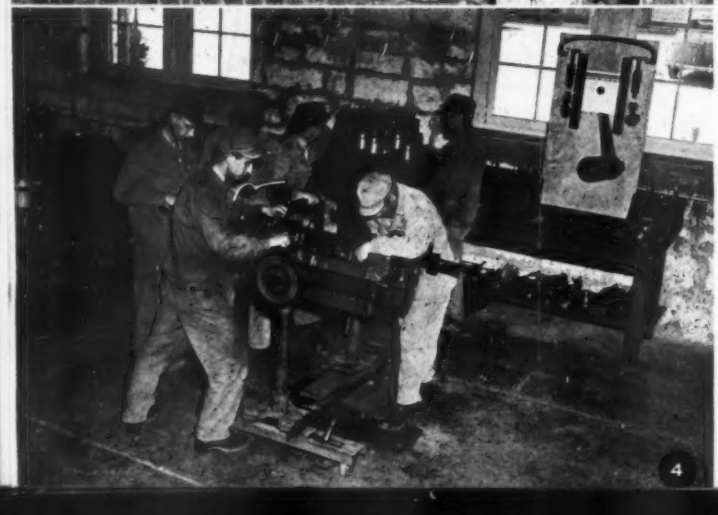
To become efficient motor mechanics, men must have mechanical aptitude to a marked degree. If they do not have it, they cannot possibly absorb necessary information. Students have been sent to the Cavalry School Motor Course with a *mechanical aptitude test* score of 51 and an AGC test score of 44. In such cases, either one of two things must be done: Send the student back to his organization, or give him hours and hours of individual instruction. The latter will result in a lowering of the standard of instruction for the rest of the class.

A man who is unreliable and of little use in an organization will not make a good mechanic. It has been tried. It is a waste of transportation and precious time, and a hardship on students who want to learn, for any organization to send a man to a service school motor course, if he does not meet the minimum requirements previously listed.

Training of Mechanics at The Cavalry School

The method and scope of instruction on all unit assemblies and sub-assemblies of the motor vehicle is in general as follows:

The construction and functioning are explained to the student by the instructor with the aid of charts,



models, cutaways, and vehicles. The student then studies the construction, functioning, adjustments, and maintenance of disassembling and reassembling a dead unit. When a certain type of unit is thoroughly understood by the student, he performs a 1000 mile and 6000 mile maintenance operation on a similar unit installed in a live vehicle. After construction and functioning of the unit is understood by the student, and he has performed the 1000 mile and 6000 mile maintenance operations, common troubles are placed in the unit for the student to diagnose and repair or replace. This method of instruction applies to each unit studied by the student, whether it be a generator, engine, transfer case, or spring.

The course of instruction consists of 12 phases of one week each (except the fifth phase which is three days in length). The different phases are coördinated under three principal groups; namely, the chassis group, engine group, and operations and maintenance group.

1. *Chassis Group.*

1st Phase Instruction includes the use, care, and maintenance of second echelon tools and equipment; care and maintenance of field ranges; repair of radiators; painting; soldering; welding (oxyacetylene and electric arc) and blacksmithing. Students are schooled in fundamental principles, and with practice should become proficient.

2d Phase Instruction introduces the motor vehicle and includes the study of clutches, transmissions, transfer cases, winches and pintles, bearings and propeller shafts. Figure 1 shows instruction on a front-mounted winch.

3d Phase Instruction includes the study of driving axles and axle gears, steering joints, springs and shock absorbers, steering gears, wheel alignment, wheels and tires (Figure 2).

4th Phase Instruction includes the study of hydraulic, vacuum booster, hydrovac, air, electric, and hand brakes. Instruction on hydraulic brakes is shown in Figure 3.

2. *Engine Group.*

5th Phase Instruction includes study of the construction of internal combustion engines, principles of their operation, engine valves and valve actuating mechanisms, and engine lubricating and cooling systems. See Figure 4.

6th Phase Instruction includes the study of fuel and electrical units, fuel systems, carburetors, storage batteries and starting motors, generators and generator regulation, and the ignition system (Figure 5).

7th Phase Instruction includes the study of engine tune-up and trouble shooting. All units studied in the 5th and 6th phases are brought together at this time. Sequence and thoroughness of engine tune-up and trouble shooting procedures are the main items stressed.

3. *Operations and Maintenance Group.*

8th, 9th, and 10th Phase Periods are spent in the

shop performing 1000 mile and 6000 mile maintenance operations on vehicles from the field. Maintenance is performed on motorcycles, half-tracks (Figure 6), and wheeled vehicles (Figures 7 and 8).

11th Phase Periods are devoted to maintenance in the field. During this week a 1000 mile and a 6000 mile maintenance operation is performed.

12th Phase Period, like the 11th, is devoted to field operations and includes a 1000 mile maintenance operation, loading vehicles for rail movement, diagnosing troubles on the march, a day of replacing units (ranging from fuses to springs and transfer case grease seals), and a two and one-half day march. The march usually covers a total distance of only twenty-five miles, because most of the students' time is devoted to march maintenance, including everything from unit replacement to emergency roadside repairs. Four hours of blackout march maintenance also is included. During two hours of this period, no lights of any kind are used, and all troubles must be diagnosed and repaired in darkness. During the last two hours of darkness, a small light is used when repairs are made, but blackout is made complete by using burlap bags and a tarpaulin to cover the vehicle undergoing repair. During the march, use of various field expedients is practiced and the proper use of winches and snatch blocks, A-frames, corduroys, mats, anchors, stakes, and any makeshift equipment is stressed.

Supervision of Mechanics

Students graduating from the Cavalry School Motor Course have a foundation which, with practical experience, will enable them to become highly proficient in their field. Because of the short time allotted for the course, instruction has been fast and, to some, furious. Many things are confusing in the graduate's mind. Close supervision and advice by motor officers and motor sergeants are necessary to get them oriented, and such supervision will pay big dividends.

Such things as the proper use of tools and equipment, checking of electrical and fuel units, adjustments, scopes of 1000 mile and 6000 mile maintenance operations, road testing, and trouble shooting require months of practice before a mechanic can become truly proficient.

Conclusion

It is believed that defects in our military vehicles can be reduced to an average of four or five per vehicle—

If drivers are more carefully *selected*, and more thoroughly *trained* in difficult operations;

If close *supervision* and *inspection* of driver performance is made by officers and noncommissioned officers;

If prospective motor officers and motor mechanics are *selected* on the basis of the *minimum requirements* previously stated;

And *if* more assistance is given to graduates of motor courses by the motor officers and motor sergeants upon their return from school.

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Training Drivers at the CRTC

EDITOR'S NOTE: *In the Motors Department at the Cavalry Replacement Training Center there are two separate schools—the Motor Mechanics School, which teaches maintenance and repairs; and the Motors School which instructs men to drive tanks, scout cars, motorcycles, light and heavy trucks, and bantams. Articles on the Motor Mechanics School and Motorcycle Training appeared in the March-April issue of* The CAVALRY JOURNAL. *This article deals primarily with that course in the Motors School pertaining to the training of the other motor vehicle drivers.*

IN the Motors School, trainees are assigned to the vehicles for which they are best suited. Physical capabilities and past experience are the usual factors deciding the one to which a man is assigned.

Perhaps the most rigid requirements are for prospective tank drivers. Not only are ruggedness and strong backs essential to withstand the shock and shake up that the men receive, but good eyesight without the use of glasses is also necessary because of the limited visibility from the vehicle. These factors are "musts" for all tank drivers. The tank school, more than any other department, loses men because they lack sturdiness and the ability to "take it."

Starting with a film strip on basic driving, the trainees practice maneuvering over all types of terrain. In this, much emphasis is placed upon the proper gear selection. During the last two weeks of the course, tank men participate in a field exercise for Cavalry School students. They use live ammunition, and really train "under fire." The tank course is concluded with a graduation cross-country ride with blind ports.

In choosing men for scout car training, height is necessary so that the driver may see over his vehicle. Just as aggressive combat is emphasized in tank training, so does reconnaissance play a big part in the operation of the vehicle. After the men have mastered nomenclature, functioning, and basic driving, they are schooled to be "sneak and peek" experts. During the last few weeks, emphasis is placed on tactical exercises that combine both mounted and dismounted action. At this time, a practical application is given to all theory that has been studied.

While the two courses for training drivers in light and heavy trucks have much in common, they differ sharply in several respects. In work with the six-by-six, emphasis is placed on defense against all types of attack. In the smaller vehicles, reconnaissance comes first.

In addition to basic driving, during the first six weeks, the men receive instruction in map reading, orientation on the ground, camouflage and explosives. The remainder of their course consists of tactical training in field exercises and road marches.

There seems to be something fascinating about the quarter-ton truck. If the trainees had their way, probably about ninety per cent of the drivers would take the bantam course. Although this vehicle is easier to learn to drive than other types, trainees are given much more extensive instruction in tactics, security and map reading. All drivers must know these subjects well, as there is no way of knowing where they will go or what their duties will be, with this all-purpose vehicle.

Three tactical night exercises are held during the second three weeks. Close order drill calls for as much precision and snap as if the men were dismounted. The final week involves several bivouac and march outpost problems in which all-round security is stressed.

Each of the seven courses given by the Motors Department does a thorough job in turning out efficient drivers and skilled mechanics. The men know that they are to become battle replacements and are eager to take their place in combat. They have confidence in their vehicles, and are fortified by the strength that knowledge brings.

Book Department

JOURNEY AMONG WARRIORS. By Eve Curie. Doubleday, Doran & Co. $3.50.

This is much more than a panorama of the battle fronts of the world. It is an overwhelmingly human account of the people who make up not only the fighting fronts, but the supporting production fronts, of the Allied nations. It could have been written only by a person reared in a world that knew no boundaries but scientific truth, yet whose heritage was rooted in two conquered nations.

Untinged by private opinion, this magnificently written book gives the reader an extraordinary grasp of the essentials of each nation's political and social problems, as found among the people of all classes. With a shrewd detachment, Miss Curie has studied the various countries, and with warm-hearted enthusiasm she has described what she has seen. Her exceptional ability to describe personalities with vivid understanding rather than dazed awe, makes even the most famous of her companions alive and vital. This human quality is a definite contribution to the reader's comprehension of national problems.

Miss Curie's picture of Russia is powerful, moving, and honest—in many ways the best with which we have been presented. This is partially due to the unprecedented privileges granted her in the Soviet Union. She went into villages but two days back in Russian hands, and of the inhabitants she said: ". . . I felt suddenly very close to them, perhaps because I was French and because my mother came from Poland. I was sadly rediscovering something which the French and Polish people had known for generations: that only a country which had stood foreign invasion really knew what war was."

From the Middle East, through Syria to Russia and on to China and India, she journeys with an unwavering enthusiasm that carries her reader on the crest of her own intensity.

Her brilliant writing, shrewd observation, and superb management of her material make Miss Curie's book the most important contribution of its kind to war literature.

✦ ✦ ✦

BETWEEN THE THUNDER AND THE SUN. By Vincent Sheean. Random House, Inc. $3.00.

Continuing the pattern of the war begun in Spain, this book will be welcomed by those who read with sympathetic interest *Personal History* and *Not Peace But a Sword*. Less violent in its denunciations, it nonetheless carries the same firm convictions found in the earlier books.

It commences with a picture of the dying European world that was a familiar background of such characters as Maxine Elliott, Forbes Robertson, Shaw and a Winston Churchill giving his former king a lesson in English democracy. This brief prelude is in strong contrast to the mad confusion of the fall of France, and the ensuing Battle of Britain with its stunned rejection of defeat.

Every mile of his trip home via China, the Philippines, and Wake and Midway Islands, revealed the unpreparedness, not only of munitions and men, but of minds, for the coming war.

Mr. Sheean is in no sense a military observer, but he is a passionate liberal and humanitarian, and as such, he views the war in its influence upon human values.

✦ ✦ ✦

THEY CALL IT PACIFIC. By Clark Lee. Viking Press. $3.00.

Clark Lee had what might be described as a "ringside seat" for the fall of the Philippines, and it wasn't a pretty show.

Primarily a newspaper man, he has made the maximum use of his training and opportunities. The result is a thrilling account of the magnificent defense put up by the men who were finally forced to surrender at Corregidor, but more particularly of *the men who made that retreat possible, the 26th Cavalry*.

As a matter of historical record, this book will probably remain of tremendous value long after the news-interest is past. Mr. Lee's observations in China and Japan, prior to November, 1941, gave him an excellent background on which to base his analysis of the Philippine situation, and enabled him to see the problems with greater clarity than would have been possible without his oriental contacts.

This book covers for the Pacific islands what Vincent Sheean's *Between the Thunder and the Sun* covers for Europe. These two books give a comprehensive, coördinated picture of what is happening to the world that would be difficult to obtain, even if time permitted, from a thorough reading of every day's news.

✦ ✦ ✦

THEY CAME AS FRIENDS. By Tor Myklebost. Doubleday, Doran & Co., Inc. $2.50.

This comprehensive story of the spirit of the Norwegians and their struggle to hold fast to their democratic ideals is timely, informative, and interesting. It covers the days of the early conquest in 1940, when the Germans "came as friends" and blindly believed that the Norwegians would extend them a hearty welcome because they were of a similar bloodstrain, but the patient stubbornness of the Norsemen came very close to defeating their conquerors.

The thoroughness with which the medical, labor and ecclesiastical groups united in their fight against the invader, contributed much towards coördinating the underground rebellion under experienced leaders.

The author has drawn an understanding picture of the Norwegian people, whose fundamental characteristics during their enslavement have been exemplified in their determination to survive and their willingness to suffer, and continue to suffer, in order that their sons may fight on against the enemy.

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HOW TO SHOOT THE U. S. ARMY RIFLE. *The Infantry Journal.* $.25.

The Infantry Journal has produced an excellent manual, graphically illustrated, on *How to Shoot the U. S. Army Rifle.* The pictures and text are well coördinated and should prove valuable to any man training for combat service.

I SEEK MY PREY IN THE WATERS, THE COASTAL COMMAND AT WAR. By Squadron-Leader Tom Dudley-Gordon. Doubleday, Doran & Co., Inc. $3.00.

TORPEDO! STORIES OF THE ROYAL NAVY. By Commander Gilbert Hackforth Jones, R.N. William Morrow & Co., Inc. $2.50.

These are two exciting books on the war—factual stories of the sea and the air over the sea.

I Seek My Prey in the Waters is the result of the experiences of three R.A.F. officers whose observations include the sinking of the *Bismarck,* the torpedoing of the *Lutzow,* the capture of a U-boat by a Lockheed Hudson off Iceland, and many other incidents of this war.

Torpedo! is an effort to bring alive the men of the Royal Navy. They are not supermen, but men to whom the sea is home. The stories are exciting, tragic, humorous—even as the lives of the men are made up of these reactions.

ARMY BRAT. By Tommy Wadelton. Coward-McCann, Inc. $1.75.

Tommy Wadelton is growing up. Unlike his two previous books (*My Mother is a Violent Woman* and *My Father is a Quiet Man),* which were autobiographic in nature, *Army Brat* is primarily fictional, although many characters, such as the Chinese houseman, Sui Jen, are drawn from life.

The story takes an "Army Brat" from his boyhood days in a motherless home to the time when, as a Lieutenant in the Army Air Force, he goes to China to fulfill his debt to Sui Jen, the finest influence in his early youth.

The story is delightfully told, and retains much of the humor of former books by this young author—whose first published story appeared in The CAVALRY JOURNAL in 1939.

MASTERS OF MOBILE WARFARE. By Eldridge Colby. Princeton University Press. $2.00.

Contending that, although mechanization enables armies to move faster, it has not altered the basic principles of mobile warfare, Mr. Colby draws lessons from three of the military masters of all time: Marlborough, Frederick the Great, and Napoleon.

This little volume is an interesting study, well written and illustrated with small but excellent maps.

IT'S 'ARD TO GO WRONG IN THE CACTUS. By Kay Grant. William Morrow & Co., Inc. $1.00.

An Australian girl has written this zany book of poetry that deals principally with American soldiers and Australian girls.

From it, we judge that the American doughboys have made a hit with the girls from "down under."

THROUGH HELL TO DUNKIRK. By Henry de la Falaise. Military Service Publishing Co., $2.50.

This is another eye-witness account of what one man saw of the Battle of Flanders and the evacuation at Dunkirk.

The author is a graduate of the Sorbonne and served in the French army from 1915-1918. During the latter part of January, 1940, he was attached by the Headquarters of the Franco-British Military Mission of Liaison in Arras to the 12th Royal Lancers.

In this account, the author has successfully avoided the dullness frequently found in books written in the form of a diary. The characters are very much alive, and the incidents move swiftly and consecutively to their disastrous climax.

* * *

THE FIRST CENTURY OF FLIGHT IN AMERICA. By Jeremiah Milbank, Jr. Princeton University Press. $2.75.

After observing a balloon ascent in France in 1783, Benjamin Franklin wrote, ". . . Convincing sovereigns of the folly of wars may, perhaps, be one effect of it (air progress), since it will be impracticable for the most potent of them to guard his dominions."

Mr. Milbank traces man's slow, discouraging struggle to conquer the air, from this American's first interest in embryonic aviation to 1895, when The Aeronautic Society was established in Boston.

This interesting and factual account will be an addition to any library of aeronautics, professional or lay. The excellent format and illustrations will be a delight to any lover of fine volumes.

* * *

VICTORIES OF ARMY MEDICINE. By Colonel Edgar Erskine Hume. J. B. Lippincott Co. $3.00.

Colonel Hume has thoroughly reviewed the accomplishments of the Army Medical Corps, and it is a creditable record.

Every war has brought forth marked advances in medicine, not only surgical but preventive as well. On these advances, made largely by the Army Medical Corps, civilian medicine builds during years of peace.

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* * *

HOW TO PREPARE FOR MILITARY FITNESS. By Lt. Colonel Francois D'Eliscu. W. W. Norton & Co., Inc. $1.96.

This volume contains instruction in the essentials of building physical fitness. There are chapters on calisthenics, tumbling, wall scaling, and tree climbing, outdoor and indoor obstacle courses, wrestling, boxing, elementary Judo and other valuable means of physical development.

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SEVEN CAME THROUGH. By Captain Edward V. Rickenbacker. Doubleday, Doran & Co., Inc. $1.50.

By now, almost everyone is familiar with the facts surrounding Captain Rickenbacker and his men during the internment from life through which they passed. In this book, these facts are brought forth as personal experiences, and the stark simplicity with which they are told unconsciously portrays the character of the author.

Without deliberate modesty, but rather with an innate self-effacement, obviously characteristic of the man, Captain Rickenbacker unconsciously reveals himself as a leader in whom men instinctively trust, and without whom survival might not have been possible.

The reader feels that a culmination of years of self-discipline and philosophy found their justification in those twenty-one days, when organization and faith were essential.

A FRENCH OFFICER'S DIARY. By D. Barlone, formerly Captain, 2nd North African Division. Cambridge University Press. Macmillan Co. $2.00.

Major Barlone served in the first world war. He reentered the army to fight for France in the second. His diary from August 23, 1939, to October 1, 1940, describes with frankness the misuse of matériel and the waste of man power that characterized the days during which France fell. The lack of coördination among the higher officers, and the consequent mental confusion produced in junior officers and men, was not only disheartening; it was disastrous.

While the facts of this period are well known, they are here analyzed from a military point of view.

The personal struggle of the author is probably characteristic of that faced by almost every French officer. His efforts to reach de Gaulle and fight once more for a Free France comprise a very interesting closing chapter.

TUNIS EXPEDITION. By Darryl F. Zanuck. Random House, Inc. $2.00.

A sense of good theater does not necessarily produce a worthwhile book. That the requirements of the two arts are very different is amply proven by Colonel Zanuck in his account of the expedition in Tunisia. His predilection for great names weakens the reader-interest. There is too much of "Who's Who" doing what on the African front, and too little account of what our fighting forces are doing, to make this book one of enduring interest to either fighting men or the public.

CHILE, A GEOGRAPHIC EXTRAVAGANZA. By Benjamin Subercaseaux. Macmillan Co. $3.00.

On a market glutted with war books—good, bad and indifferent—it is a novelty to find a delightful, cleverly written story of a country about which the average North American should know a great deal more than he does.

Senor Subercaseaux, one of the younger school of writers in Chile, has written a charmingly satirical explanation of his country and his people. It will undoubtedly inspire the reader to learn more about this interesting South American country.

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